...IGHT, APRIL 16, 1936

FIRST AERO WEEKLY IN THE WORLD

REGD. AT THE G.P.O. AS A NEWSPAPER

FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

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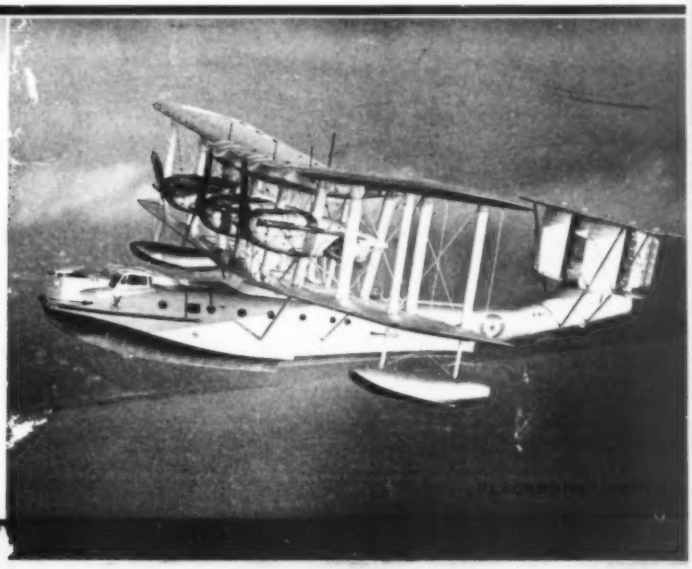

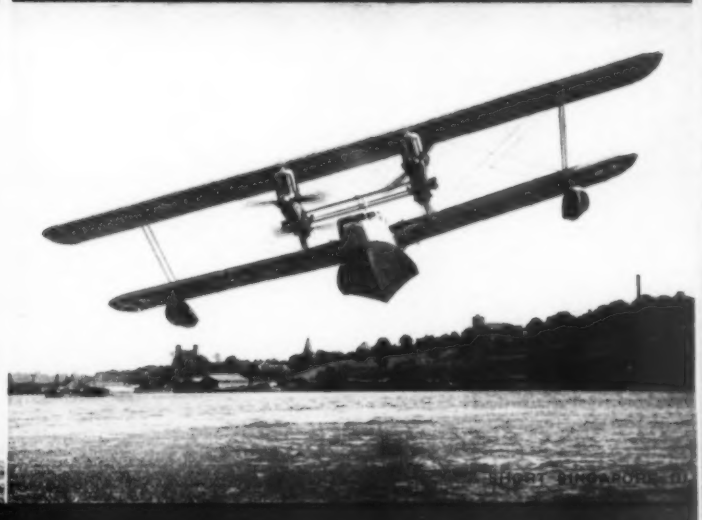

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FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

FIRST AERONAUTICAL WEEKLY IN THE WORLD : FOUNDED 1909

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The Provision of Pilots

SOME few years ago a school at Highgate, inspired, doubtless, by the Air Ministry's patronage of the flying clubs and the University Air Squadrons, decided to start instruction in aeronautics. Since then the training ships H.M.S. *Worcester* and *Conway* have started special classes for cadets who wish to take up civil flying as their work in life ; and it may be taken as certain that as the opportunities of careers become more general every leading educational establishment will have to place aeronautics on its syllabus. Solo flying is forbidden by law to those under the age of seventeen, but there is nothing to prevent even babies in arms from being taken up as passengers and so growing accustomed to the air. With this experience, and a good grounding in the principles and practice of flying, such youngsters should readily become competent pilots as soon as they reach the legal age. Horsemen, seamen, and airmen are all of them the better for having grown up with the art which they practice.

That it is very desirable for the British to become a nation of airmen will be seriously disputed by none. This dogma used to be supported by the advice to look at the map of the British Empire. It was good advice, but now it is better still to look at a similar map with the routes of Imperial Airways marked on it, and also the routes which that company has in mind. Such a map will convince even a doubter, if any such exist, that the British must seek their future in the air, while not forgetting the claims of the sea.

At the present time, however, we must not disregard the need of an ample supply of pilots for air defence. Lord Swinton says that he needs 600 *ab initio* pilots to join the Reserve this year, and 800 in each of the next two years. That should make a very useful nucleus, but the pilots of the Reserve are taught only part of the work of an Air Force pilot. On mobilisation they would be attached to regular squadrons and would have to learn squadron work before they could become really useful cogs in the machine of air defence. Twelve good pilots in twelve good aeroplanes do not make a working squadron until they have had a considerable period of combined training. That is a point which some people are inclined to overlook. In the air, quality is more important than mere numbers. As Lord Trenchard once said to the County of Middlesex Squadron, a good squadron will cut its way through a lot of inferior material as a knife cuts through butter; and a high pitch of training is one of the most important of the elements which go to make up excellence. For that reason there need be no apprehensions that the destruction of London is imminent because this or that foreign nation may have *recently* built a large number of aeroplanes and trained a large number of pilots. Until those pilots have been thoroughly drilled to work as an air force they are a danger to nobody. For the same reason it is very desirable that at least a large proportion of our own Reserve should be attached to regular squadrons as part of their training.

Expanding the A.A.F.

An increase in the Auxiliary Air Force is another way of getting pilots, not only trained to fly, but trained in combined work. To quote Lord Trenchard again, he suggested in the House of Lords last month that there should be a squadron of the A.A.F. at every town of over 20,000 inhabitants. It is a most excellent suggestion. Other suggestions for increasing the number of pilots in the country have been put forward, and a few days ago a correspondent of the *Daily Telegraph*, in a letter which was published on the principal page of the paper, urged that what he called a Territorial Air Force should be formed, with a unit in each county. He evidently overlooked the fact that the Auxiliary Air Force is on the same footing as the Territorial Army in that it is managed by the Territorial County Associa-

tions. It would hardly be possible to run two separate forces under the same management, and, moreover, in his scheme the pilots would be taught to fly by R.A.F. instructors, but would apparently receive no training in combined work. It would be far better to adopt Lord Trenchard's suggestion and have an A.A.F. squadron in every large town. This would add immensely to our strength in case of attack, and it would also provide a large number of pilots who would go far to make us a nation of airmen, ready to take full advantage of the openings offered as air transport becomes fully developed throughout the British Empire.

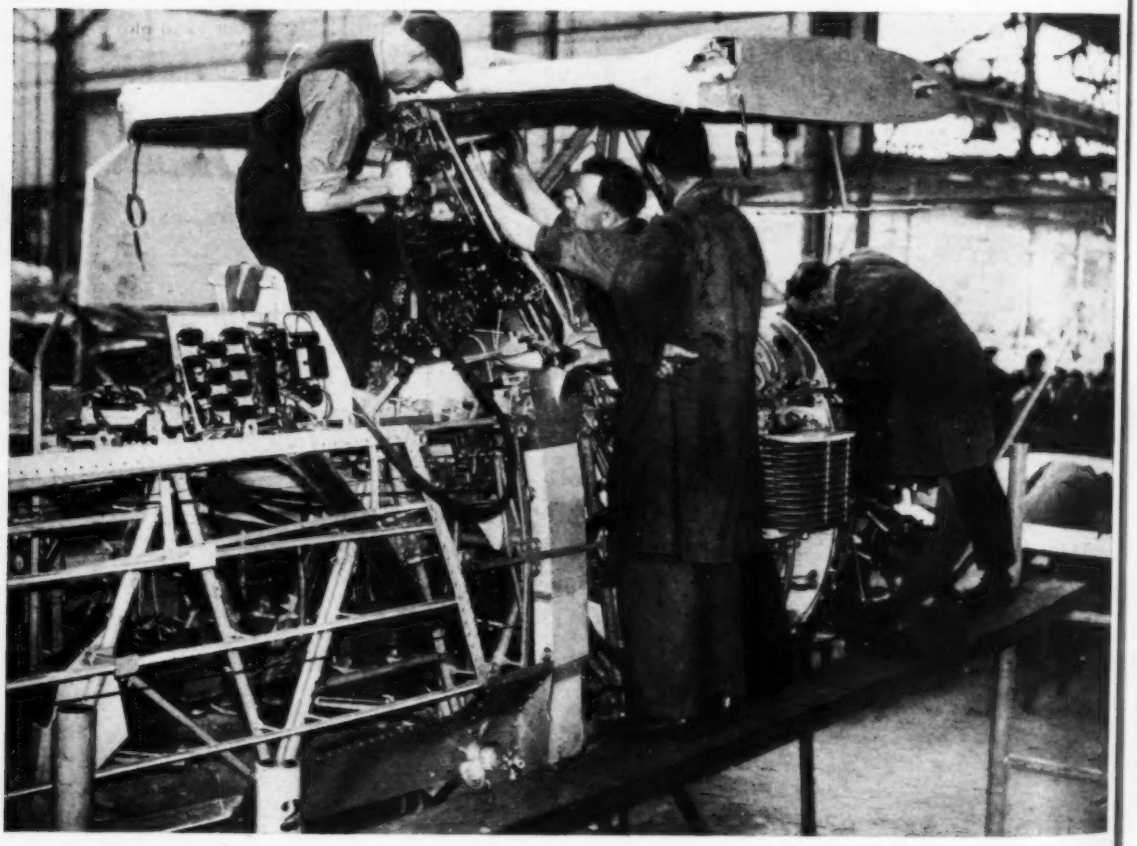
Civil Flying in Canada

AN extremely interesting and important change has recently been announced in Canada. There, as in Australia, all forms of flying have hitherto been administered by the Department of Defence. In both those Dominions the three fighting Services, Army, Navy and Air Force, are under the one Minister, and up to the present the progress of civil flying and of the Air Force have had so much in common that it has been thought inexpedient to divorce the two. In South Africa, on the other hand, civil flying was years ago placed under the Department of Railways and Ports. Now, if the Press of Canada is correct, civil flying in that Dominion is to be transferred from the Defence Department to a newly formed Department of Transportation.

In Canada a marked distinction is made between air transport and what in this country would be called civil flying. A great deal of the time of the Royal Canadian Air Force has hitherto been taken up with what could properly be called civil flying—forest fire patrols, survey, etc. Of late years a good deal of this work has been contracted out to civil companies. It is only air transport which is to be transferred to the Department of Transportation.

No Analogy

There are still parties in this country who hold that the care of all civil flying should be taken away from the Air Ministry and entrusted to either the Board of Trade or the Minister of Transport. No good case has been made out for such a transfer, for, as has been often pointed out in these columns, the Director-General of Civil Aviation is in a sufficiently independent position, and his energies are not cramped by the Service side of the Air Ministry. The circumstances in the United Kingdom and in Canada are, however, so different that arguments from one country would not apply to the other. Under a Department of Defence it is possible that air transport might be allowed to languish, and, therefore, the change is probably wise in Canada. In this country there is no Department of Defence.



OUTPUT: "It can almost be said that we have reached a position where the primary structure is of secondary importance from the point of view of the man-hours required to build it. It is the installation of equipment which runs away with the time . . ." Point is lent to this quotation from a recent *Flight* leader by this picture of a Fairey Swordfish having its equipment installed.

The Outlook

A Running Commentary on Air Topics

Suck In !

THE summer flying season has begun. At the time of writing that is more than can be said of the spring, but we still hope. The first ball of the season (to use a cricket metaphor) was bowled by Mr. "Comet" Scott at Kingston last week, when he held the opening meet (metaphors are getting a little mixed) of the air-circus season, succeeding to the throne whereon once sat Sir Alan J. A buggy ride at Southend, where *les Poux* most did congregate, was a follow-on to the first innings. And now we are fairly launched in what promises to be a whirl of airscrews and gaiety.

What a vista lies before the private owner with plenty of leisure! In May he may (no pun intended) start soberly with the R.Ae.S. garden party at Hayes and a visit to the Aero Exhibition at charming Stockholm. But on the 23rd prox. he will be faced with a choice to be made between the frivolity of a club display at Bristol and the varied but deadly earnest attractions of Empire Air Day. No sooner has he recovered from one or the other of these than he will have to decide whether to fly for four days through Austria, Hungary and Switzerland with the Austrian Aero Club, or only through Switzerland with the Swiss Aero Club. Whichever he does, he will miss the race from Hanworth to the Isle of Man and the Marseilles week-end. But all the survivors of all these four events will just be in time for a nine-days tour of Czechoslovakia under the auspices of the national club. By then he will be well into June, which will be a no less hectic month.

Space does not permit of following the air programme right through to its dignified close at the Paris Exhibition in November, but the owner-pilot should remember to keep the dates July 23-26 open for the R.Ae.C. Week-end Aerien, when British pilots hope to return all foreign hospitality with interest. If they have accepted all the foreign invitations, there will be a good deal to return.

Instruction or Thrills?

THERE is no doubt that the opening flying display of the year showed a number of distinctly new possibilities. Not only are the joy-riding rates lower, probably, than they have ever been before, so that more people will be encouraged to discover that there is really nothing very terrifying about this flying business, but the general public is also being shown at least a few types which might eventually appeal to them as private owners. Flying lessons are being given and scholarships are being awarded to those newcomers who show the greatest aptitude.

Nevertheless, the touring air displays even of to-day are still lacking in any real capacity to make people look on flying as something much more than a mere "stunt." It is useless to pretend that these shows are run for any other reason but the perfectly justifiable and reasonable one of making money, and if the general public demand to be thrilled, then thrilled they must be. The kind of event, and the loud-speaker comments thereon, designed for this purpose are the very reverse of those which are likely to suggest that flying is a perfectly normal means of transport.

Surely it should not be beyond the ingenuity of man to devise a programme in such a way that the public is really educated *and* thrilled? In some way—using a knowledge of crowd psychology—the purely spectacular turns should be much more clearly differentiated from those which are firmly educative.

Segregation

QUITE obviously, the bigger passenger machines, at least, should not "shoot up" the crowd, and it is doubtful if the massed formation idea can be considered as a good one in these days. To use an Americanism, there is far too much of this "Am I tough—or am I tough?" business about the whole atmosphere of the travelling air display. No pilot who is bravely placarded as some sort of death-defying hero should ever appear publicly, so to speak, as a joy-ride pilot as well; travelling by air should be made into a very different thing from the mere circus performance.

Incidentally, it would be worth the while of quite a number of manufacturers to send one or two of their machines along to those displays which are being held in fairly prosperous districts. These manufacturers would probably be only too pleased to do so if they felt that the atmosphere was entirely suitable for such demonstrations. None of them would expect to sell their machines on the spot, but it would be a good and fairly inexpensive method of "showing the house flags" and of giving the public some knowledge of the number of machines which are available at quite reasonable prices. However, it would be necessary for the display organisers to plough the land first; in other words, to give the casual public a much better idea that flying is of real value to them in their everyday lives.

Handicapping Ourselves

ANY person who is interested in the development of British air transport should proceed at once to one of the normal travel agencies and endeavour to obtain a ticket to travel abroad by any British air service other than Imperial Airways. He will fail.

When two British companies became members of the International Air Traffic Association we all imagined that these two at least would automatically become eligible to join the favoured foreign airline companies. For the present, at any rate, their position remains unaltered.

It is of little use to blame the travel agencies, since they would obviously book for any company in the world if it was possible for them to do so. Their agreements with the railway and shipping companies presumably prevent them from doing so, and for the sake of a few dozen weekly bookings they are not likely even to risk the loss of their privileges. Furthermore, one of these agencies, at least, is largely backed by the companies concerned.

We do not claim to understand the reasons for this small-minded policy, but something ought to be done about it.

"Pou" Parties

LAST Monday's *Pou-du-Ciel* Rally near Southend (reported on pages 406 and 407) provides an object lesson for organisers of future events of this type. In the first place, public curiosity about something which the newspapers have suggested is the long-awaited revolution in flying is amazingly intense, and organisers must be prepared to have their aerodromes invaded by veritable armies of people determined to see, hear, and, if possible, to touch *Poux* in action. Secondly, in order that these crowds shall not be disappointed, organisers should make certain of securing plenty of flying material by doubling the number of their invitations to *Pou* owners. At the present stage the flying capabilities of the majority of these worthy insects still seem very problematical.

RINGING up th

First Performance by C. W. A. Scott's the Gospel of the In Six Months' Progra

Mrs. Crossley, the Display's lady aerobatic pilot, with Master Rice (whose father deals with the publicity) and the Hillson-Praga Baby monoplane. (*Flight* photograph.)

WITH the spring, the fancy of many a country and provincial lad and lass turns—not so lightly in many cases—to forthcoming displays of flying in their district. The travelling flying circus is anticipated with just as much pleasure, and watched with infinitely more instructional gain than the itinerant fairs of yesterday.

The season's programme of Mr. C. W. A. Scott's "Flying for All" Display embraces over 150 centres in the United Kingdom and Irish Free State, and aims particularly at familiarising people with some of the cheap, easy-to-fly light aeroplanes available to-day. The ever-popular "chestnuts" popularised at previous displays have been preserved to cater for the purely spectacular tastes of the crowd. All are well presented.

This year's first public performance was given at the field near the Ace of Spades on the Kingston By-pass - last Tuesday week. On Thursday the Display was at Chesham, on Good Friday at Dorking, and on Saturday at Redhill.

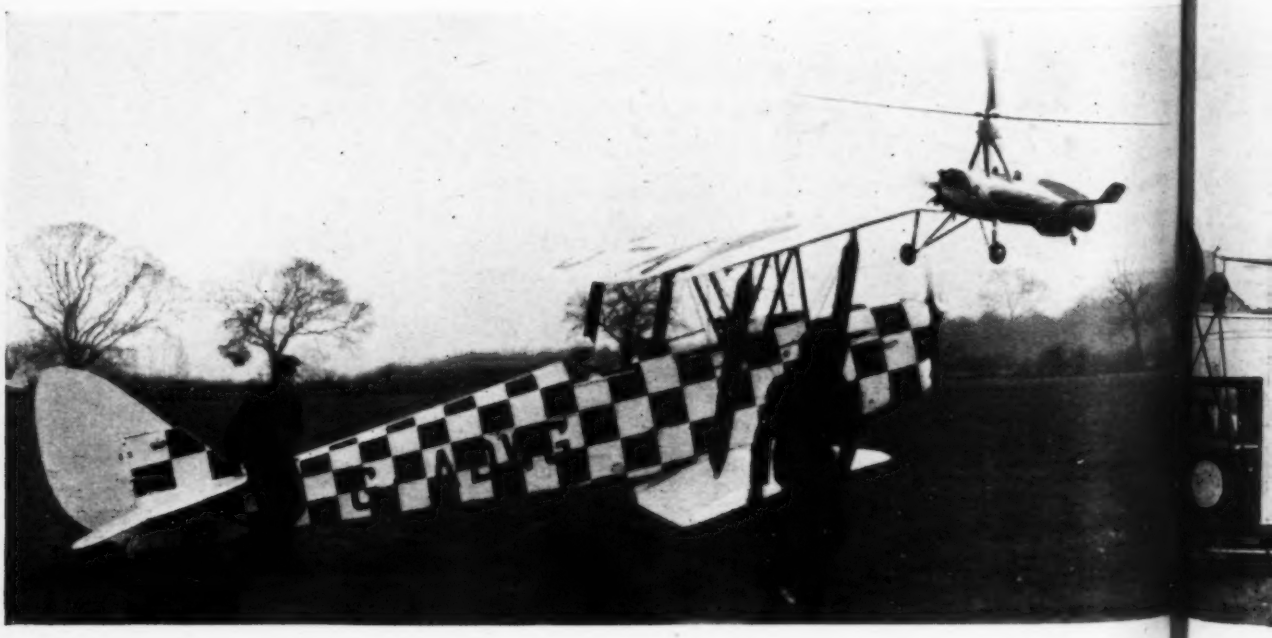
The first of the season's performances did not include the full quota of "turns" which will normally be put on. The machines at Kingston—or, more accurately, at Hook—were one of the two Airspeed Ferries (now fitted with one Gipsy III and two Gipsy Majors), a pair of Avro 504's—one with a Lynx and the second a Mongoose, an Avro three-seater unstaggered Cadet (Genet Major), a D.H. Tiger Moth, a C.30 Autogiro, a B.A.C. Douglas-Drone, and Miss Joan Meakin's Wolf glider. A *Pou-du-Ciel* (Carden) and the Hillson-Praga remained at Hanworth.

The ground was soggy, the wind cold and gusty, and the aerodrome by no means oversized or level, but apart from a few minor boggings the whole show went commendably smoothly. An encouraging crowd—its ranks were noticeably swelled by local scholars who had "broken-up" that day—lined the enclosure.

Captain Phillips set the ball rolling by taking up a pair of passengers in the Lynx Avro and showing them and the crowd just what an ex-Service type trainer will do in the way of aerobatics if asked nicely. At about 1,500 feet he released a coloured streamer which he proceeded to carve into small ribbons on his tortuous descent. The Avro was still shedding shreds of streamer as it taxied in with passengers grinning bravely.

Mr. Shotter and Mr. Rimmer then started doing a steady joy-riding trade with the Cadet and the Mongoose Avro. Later they were joined by Capt. King in the rejuvenated Ferry which, with a load of passengers, seems to have

Going On and Coming Off: Mrs. Crossley taxies out in her chequered Tiger Moth, and Mr. Ashley sets down the Autogiro before the crowd. (*Flight* photograph.)



the CURTAIN

Scott's Flying Display : Spreading Inexpensive Light Aeroplane : A Programme

little bother in getting in and out of confined spaces. The faithful old Avros, of course, came and went with the greatest facility.

The Douglas-engined B.A.C. Drone was demonstrated very effectively by Mr. Idwal Jones. Its recent achievements, low price and main features were recalled by the announcer, Mr. Roy Arthur—a human soul plagued by the encroachments of hordes of small boys on to the aerodrome. Mr. Idwal Jones droned back and forth parallel with the enclosure with his arms above his head and waving his hands (see picture overleaf).

Then Mr. Seth Smith landed in the demonstration Monospar S.T.25, which the visitors, according to sex, agreed was a nice aeroplane or had a *chic* colour scheme. This, of course, was an unofficial turn.

The Monospar was to have joined in the next event—a formation flight—but was unable to de-bog itself in time. However, the Ferry, two 504's, a Tiger Moth and a Cadet carried on the good work. Each machine, after leaving the formation, dived noisily and, one regrets to record, alarmingly near the crowd; the big Ferry was no exception.

Meanwhile, the S.T.25 was extricated from the soggy Surrey soil and went gaily on its way, looping gracefully in farewell.

A Genetic note announced the approach from Hanworth of Mr. R. J. Ashley in the Display's black and orange C.30 Autogiro. Mr. Ashley showed why an Autogiro is.

Mrs. Crossley ("the first woman to demonstrate aerobatics"—*vide* the programme, and "the only lady aerobatic pilot in the world" according to the announcer) took off in the red-and-white-diced Tiger Moth to give the visitors their next periodic dose of aerobatics. And a pleasant potion it was, with nice clean loops and rolls and a *pukka* professional polish. The machine had a fuel sys-

Administrators : From left to right, Capt. P. Phillips, D.F.C. (Managing Director), Capt. J. R. King (Chief Pilot), Mr. C. W. A. Scott (Chairman) and Mr. D. L. Eskell (General Manager). Behind is the little Hillson-Praga Baby which will be available for trial flying lessons. (*Flight* photograph.)

Spring in the Air : Capt. King in the act of giving everyone a close-up of the Airspeed Ferry. One of the smart vans attached to the display is in the foreground. (*Flight* photograph.)

tem adapted for inverted flying, so Mrs. Crossley took advantage of this for a few seconds.

Incidentally, this particular Tiger presents a problem for policemen. From even a few yards' distant it is difficult enough to decipher the registration letters because of the camouflage effect of the red and white squares. The "chequered career" joke was duly cracked *via* the microphone.

A really beautiful performance was put up by Miss Joan Meakin (Mrs. Ronald Price) on her Wolf glider. One understands that Miss Meakin had not "glid" for two months, but her husband, who is assistant general manager of the Display, did not seem unduly perturbed. The glider was towed off by Captain Phillips and cast off at an appropriate height. During her quiet spiral earthward Miss Meakin looped daintily, after dives up to 40 or 50 m.p.h., and threw in a few stalled turns for good measure.

The Wolf glider, by the way, was designed by Herr Wolf Hirth, and has a wheel and a skid beneath the fuselage specially for this type of work. The span is 48ft.

When the Display gets working at full pressure it will include demonstrations and trial flying lessons in the Hillson-Praga; the picking-up-the-handkerchief-with-a-wing-tip trick by Mr. Idwal Jones; demonstrations with the *Pou* (sponsored by George Bassett and Co., of liquorice allsorts fame); aerial marksmanship; inverted flying by Mr. Idwal Jones on the "Tiger"; a parachute descent by Mr. H. Harris, using a G.Q. outfit; an air race with the machines carrying passengers; and sundry surprise items and competitions. A gentleman with a Nuswift fire extinguisher will ignite petrol poured over the engine of his Ford. The conflagration, judging from a demonstration one saw at Kingston, will be summarily dealt with.

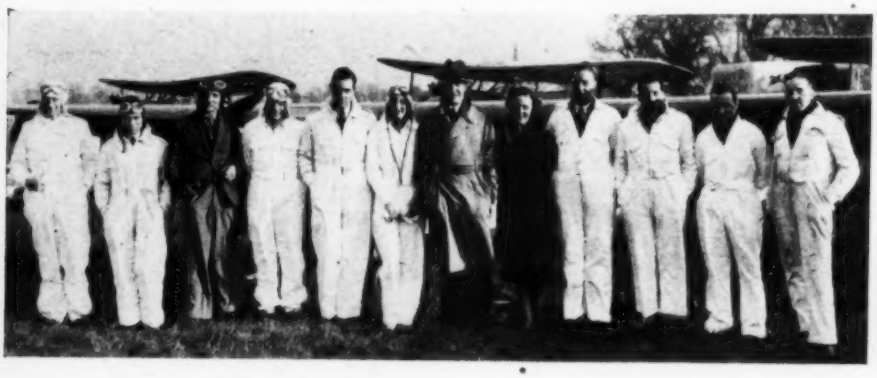
(Above) The Fleet: Miss Joan Meakin's Wolf glider, the Airspeed Ferry, and the B.A.C. Drone are in the foreground.

"—nothing up my sleeve." Mr. Idwal Jones demonstrates the docility of the B.A.C. Drone. (*Flight* photograph.)

Attached to the Display is the "Aero Show Marquee," which contains pictures and models of aeronautical interest.

Speedy refuelling is one of the minor problems in display work. The Scott outfit has solved it with the aid of a National Benzole 800-gallon tanker on a six-wheeler chassis.

Joy-riding prices have been very considerably reduced compared with those at previous displays. Aerial baptisms can be performed for as little as three-and-six.



The Staff: (Left to right) Messrs. H. A. Shotter and A. L. Harris, Capt. P. Phillips, D.F.C., Capt. L. J. Rimmer, Mr. R. J. Ashley, Mrs. W. Crossley, Mr. C. W. A. Scott, Miss Joan Meakin (Mrs. R. Price), Capt. J. King, Mr. Idwal Jones, Mr. Martin Hearn and Mr. J. L. Bebb. (*Flight* photograph.)

Who's Afraid: Miss Joan Meakin, who does just what she likes with the Wolf glider. (*Flight*)

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS

A POWER-OPERATED gun turret patented by Armstrong Whitworths is spherical in shape and covered with bullet-proof glass.

Poland has acquired the rights to use the Handley Page slotted wing.

The King has invested his air equerry —Flt. Lt. M. M. Moller—with the M.V.O.

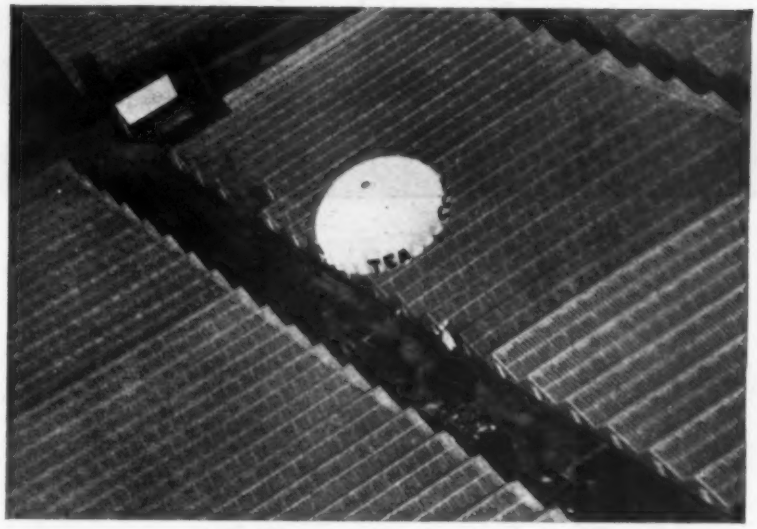
Thirty-one high-speed American bombers of unknown make are being built for China.

The latest high-speed figure for the Gloster Gladiator with the 715 h.p. Mercury IX is 264 m.p.h.

Harland and Wolff are arranging for the construction of a large aircraft factory at Belfast.

Belfast Harbour Board is constructing a combined land-and-seaplane base on 400 acres of reclaimed land at Sydenham, Belfast.

Members of the Air Council and the Director of Civil Aviation will attend an "aviation service" in Canterbury Cathedral on June 20.



PEOPLE WHO JUMP OVER GLASSHOUSES . . . Miss Josephine Nadin, passing an Air Ministry test at Broxbourne before becoming a professional parachutist, unwittingly gives the photographer an opportunity. Borne on the wind, however, her Irvin deprived the local glazier of *his* opportunity.

DR. ECKENER, subject of the alternately confirmed and denied charge of having dropped something of a political brick—or, shall we say, *heil*-stone—from the new Zeppelin. This medal was struck to commemorate his former triumph with the *Graf Zeppelin*.

Twenty-five Years Ago

(From "Flight" of April 15, 1911.)

". . . . Continuing his series of experiments in passenger carrying, M. Sommer, on the 8th inst., carried four full-grown persons besides himself on his biplane from Douzy to Bazeilles and Mouzon and back, covering a distance of about 20 kiloms."

Ten Millions More

Mr. Chamberlain has announced in the House of Commons that the supplementary estimate for the R.A.F. for 1936 would be about £10,000,000.

For Snapping Snoopers

A Corps of special fast French machines fitted with wireless and cameras has been established to prevent foreign aeroplanes from flying over the forbidden French frontier zone. Photographs will be taken of any aircraft crossing the frontier.

The Trials of Hindenburg

The new Zeppelin *Hindenburg* (L.Z. 129) left Rio de Janeiro last Monday week on the return part of her maiden voyage. Trouble with one of the engines necessitated flying up the Rhone valley instead of over the Alps. A French flying boat flew out to sea to confirm the engine trouble and all cameras on the Zeppelin were collected before crossing France.

India's First?

A *Pou-du-Ciel*, constructed and flown successfully by Prof. Ashton, of the India Institute of Science, at Bangalore, is said to be the first aeroplane to be built in India from Indian materials.

The Bulldog Breed

In 1931 Esthonia bought twelve Bristol Bulldogs. All are still in service, and although each has made more than a thousand landings no major replacements have been made, excepting those necessitated through two bad landings. In winter the Bulldogs operate from the snow-bound country on skis.

Some Soviet Figures

Speaking at the Congress of the Young Communist League recently, M. Kosarieff, the general secretary, declared that 3,500 military pilots were trained in Russia last year; that 52,000 men had learned to glide; and that 8,000 more pilots would be trained this year.

THIS WAS THE WAY the A.A. reminded holiday traffic drivers of their Easter responsibilities. It is stated that the banners would not distract road users' attention, because they could be withdrawn at will—presumably when the pilot saw a piece of attention being distracted.

Private Flying

Topics of the Day

Not So Crowded

CERTAIN people often appear to me to be suffering from a very serious "collision complex." They speak in hushed tones of crowded aerodromes and of an imaginary future when it will be unsafe to venture out of doors—and certainly not into the cockpit or cabin of an aeroplane which is about to depart.

Danger, so far as it is real, is caused almost entirely by the fact that there are so many different types in the sky and that each of these types has a different field of view for the pilot. More than once my nerves have been shattered by the sudden appearance of another machine from behind the centre-section or some other imposing mass of material.

This differentiated blindness is not of any great moment in the course of normal cross-country flying, but is definitely dangerous during anything but a straight approach. Although the glide paths of different machines vary considerably, these tend to converge towards one point in the three dimensions while coming in to land—particularly at aerodromes on which the useful area is narrow.

The fact remains that one can fly all over the country and never see another machine outside the immediate vicinity of the various aerodromes. Even if fair-weather private flying increases at a rate comparable with that experienced on the roads of this country during the past ten years there will still be plenty of room.

Standardised Outlook

SOONER or later, however, the manufacturers of light aeroplanes will need to get together in order to decide on certain reasonable standards of all-round, and particularly forward, visibility. In due course there should never be two machines in the air from which the pilot of one cannot always see the other.

That it is possible to provide a very good forward view even with a single-engined side-by-side seater is shown in the Hornet Moth, and, for the life of me, I've never been able to understand why something on the lines of an overgrown Drone did not become the standard private-owner type years and years ago. Ever since the day when I spent half an hour or so wandering about the sky in a Super Drone I have been mildly impatient of even the very best and quietest tractor aeroplane. We suffer its minor discomforts in 1936 simply because Bleriot used one when he crossed the Channel in 1909.

A Comparison

WHILE motoring away from a Q.B.I.-ed Croydon the other day I was particularly struck by the differences between ground and air transport even in these comparatively enlightened days.

On the airport, machines could be seen appearing out of the murk from directions which were certainly different from usual—they had been brought in by D/F after being asked to hang about for a considerable period—and rockets were being fired off from the control tower at a rate which would probably upset the exchequer. Outside, people were dashing along the Purley Way at a steady fifty and would probably have been very surprised if they had been told that the weather was foggy—even in the aeronautical sense.

The whole point is that the cars could slow down when necessary and were not travelling, in any case, at the sort of speed which would prevent their drivers from seeing and avoiding obstacles. Furthermore, earthbound vehicles are rather more controllable than aeroplanes, and are, after all, operating only in two dimensions.

Slow and Safe

NEVERTHELESS, it would seem that the private owner of the future, using machines which would fly as slowly, with safety, as the Autogiro or the Drone, could creep along at next to no height with more or less complete safety in conditions in which the present owner dare not leave the ground. Lord Sempill's flight to Berlin gave us some idea of what would be safely practicable in these circumstances. Nothing but a radio-equipped transport machine, manned by an experienced crew, could have made the journey on that particular day.

Admittedly, if one is to do any colliding at all, it does not matter a great deal if one rams a chimney at 20 m.p.h. or at 220 m.p.h. The results are much the same, but the 20 m.p.h. traveller has about a dozen good thinks while his faster brother is wrapping his expensive piece of mechanism round the chimney. He has, in fact, eleven times as much time to dodge an obstacle.

In such conditions, the earnest owner would be compelled to fly below a certain altitude in order to leave the real sky free for the much more important transport machines, and would not be allowed within three miles of certain radio-equipped airports designed to cope with such traffic. One or two of the slowcoaches might lose their way and wander into a prohibited area, but at the sort of speeds I visualise they would be able to read the signposts!

Needless to say, a machine which has a stalling speed of something like 20 m.p.h. is going to be something of a handful in a wind of 30 m.p.h. when the time comes to put down, but it should not be difficult to devise lift spoilers which could be brought into action at the moment of landing. These spoilers, which would, in effect, reduce the useful wing area, might also remove some of the difficulties of the approach if they were so designed that their application did not upset the handling of the machine in any way.

INDICATOR.

FROM the CLUBS

Events and Activity at the Clubs and Schools

CINQUE PORTS

DURING the week ending April 5 Messrs. Christopher Clarkson, A. M. Wynne and G. G. Jephson joined the Club. The new dope shop will soon be ready. The date of the Club's International Rally at Lympne has been definitely fixed for August 29 and 30.

The second of the new series of landing competitions was held on Easter Sunday and won by Miss Jeanne de Casalis. Sir Phillip Sassoon, Mr. Anthony Eden and party visited the Club. Mr. Melrose dropped in on his way to Australia. A course of lectures is available for "B" licence candidates and a shorter course for "A" licence pilots. Mr. Bodfield went solo on Easter Monday.

C.A.S.C.

Over the holiday, members flew 5 hr. 25 min. dual and 1 hr. 30 min. solo. Two new members have been allocated to No. 3 (Cambs) Squadron.

HULL

Flying time fell just short of fifty hours during March. Mr. A. F. Foster has passed his "A" licence tests. Mr. Jackson has become a full time instructor. Dances will be held on Saturday, April 18 and May 2.

BORDER

The 17 hr. 20 min. flying recorded during the week ending April 6 was done mostly with one machine due to C. of A. renewals. Mr. McGowan and Mr. Dumfries went solo and Mr. Eaglesfield became an associate member.

NORFOLK AND NORWICH

The B.A. Eagle and Swallow have been demonstrated by Mr. J. Rogers. The map reading and pin-pointing competition last month was won by Mr. H. C. Stringer. All tickets have been sold for the annual dinner on Friday, April 17.

READING

Miss Peggy Salaman has flown the Night Hawk; Messrs. Kirkwood, Sanders and Tomkinson (age fourteen years) have become pupils; Mr. Anderson has qualified for his "A" licence and Col. and Mrs. Duncan are receiving instruction on Hawks.

CAMBRIDGE

Two pupils returned for advanced dual on twin-engined aircraft during the week ending April 11. Flying time for that week was 45 hr. 20 min. Messrs. Cone and Miller became members and, together with Mr. Hayden, are trying to complete their "A" licence courses in about a fortnight.

SOUTH COAST

The Aeronca was demonstrated on Sunday, April 5. Messrs. Wakefield, Tomlinson and Sidnell became members. A dawn patrol has been arranged for Sunday, April 26. The following became members last week: F/O. Denison and Messrs. Sidnell, Noble, Barnes, Axelrad, Southgate, Hardwick and Rule.

PORTSMOUTH

New members during the week ending April 10 were Sqn. Ldr. R. C. Lane and Messrs. J. Grierson, M. R. Kelly and J. A. Neill. Flying time was 18 hr. 25 min. A B.A. Swallow will be demonstrated on April 18 and 19. The monthly landing competition arranged for Sunday, April 5, was cancelled owing to poor weather.

TOLLERTON

Flying time at Tollerton for the week ending April 2 was 23 hr. 40 min. Mr. J. F. Armitage joined as a flying member and Capt. Byers as an associate member. During the following week 34 hr. 45 min. flying was recorded. Mr. W. Humble joined as a flying member. On Saturday and Sunday, April 4 and 5, Mr. Appleby gave demonstrations of his *Pou-du-Ciel*.

REDHILL

The Redhill v. Maidstone bombing competition resulted in a win for Redhill, who retained the shield until the next competition in the autumn. Flying time for the week ending April 10 was 33 hr. 15 min. A twin-engined machine has been added to the Club fleet, and dual instruction in addition to solo flying is available. C. W. A. Scott's Air Display visited the aerodrome on Easter Saturday.

LIVERPOOL

Forty-four and a half hours were flown during the week ending April 2. With effect from April 1 the charge for instrument flying is being reduced to 30s. per hour. The flying time for this month up to the 11th was 65 hr. 25 min. With the commencement of British Summer Time on April 19, flying facilities will be available on weekdays from 2.30 p.m. until dusk, and on Sundays from 10.30 a.m. until dusk.

HANWORTH

Fifty-two hours were flown at Hanworth during the week ending April 11. Messrs. C. Milne, J. Brown, D. S. H. Jelly (the latter two are Air League pupils) and Mr. H. M. Laurie have become members. Messrs. P. G. Scott-Miller and D. Friegburg went solo. Flt. Lt. W. E. Knowlden completed his instructor's course. Mr. John Kirwan is back at Hanworth after delivering an Aeronca to Madrid.

NEWCASTLE-UPON-TYNE

For the week ending April 4 flying returns of the Newcastle-upon-Tyne Aero Club showed 44 hr. 20 min. Messrs. W. Thompson and A. R. Lucas went solo. Mr. F. Sydenham, who is being trained under the Air League Young Pilot's Fund, completed his licence tests. The total flying time was seventy-eight hours. About seventy members attended a social evening in the clubhouse on Sunday, April 5.

YORKSHIRE

Club machines flew 37 hr. 10 min. during the week ending April 11. This included a return trip to Brussels. Messrs. H. Williamson (Aviation Group) and J. F. H. Naylor (Young Pilot's Fund) have gone solo, and Mr. W. Bayley (Aviation Group) has passed his "A" licence tests. Mr. and Mrs. J. R. Micklethwait left Yeadon on April 8 in their Moth for a European trip. Dr. and Mrs. A. A. D. La Touche left in their Moth for Deauville on April 9.

LEEMING

During the week ending April 11 the flying time was 20 hr. 55 min. Messrs. Heath, Lamb, Donking and Headlam became pupils. Mr. J. D. Campbell went solo and Mr. B. Harman, an Air League pupil, finished his "A" licence tests. Mr. E. D. Kendrew, a Middlesbrough builder, has flown forty minutes in his home-made *Pou-du-Ciel* fitted with a Scott Squirrel engine. Arrangements have been made for the Secretary of State for Air to open York Municipal Aerodrome on a date which has not yet been fixed. A hangar is rapidly nearing completion and flying should begin at the aerodrome by the beginning of May.

HERTS AND ESSEX

Rough winds and rain limited flying during the fortnight ending April 9, but nevertheless 114 hr. 57 min. flying was logged. Mr. G. Harmsworth went solo and Miss J. E. Hasted and Messrs. S. F. Prior, W. Earle, P. H. Becken and J. H. Telford became members. Flt. Lt. "Tommy" Rose demonstrated the Falcon. Next Sunday there will be a cross-country competition for the "55 Squadron" Challenge Cup presented by S. A. Perrin, Esq., late of No. 55 Squadron. It will be an open scratch event. The fleet of the Jubilee Air Pageant was accommodated on the aerodrome for three days for the rehearsal of their show prior to a tour.

The Isle of Man Race

IN connection with the Isle of Man race, which will take place on May 30, Mr. Alexander Duckham has offered a twenty-five-guinea trophy for the first "B" licence pilot to cross the line at Douglas. On June 1, it will be remembered, a second event has been planned in the form of a three-lap "round the Island" race. Details of these two events were given in *Flight* of March 19.

Soaring on Snowstorms

THE special Easter weather which caused so much trouble in one way or another did not deter the sailplane experts who had collected at Great Hucklow, Derbyshire, for the Derbyshire and Lancashire Gliding Club's contests. Nevertheless, there were no really outstanding flights, and no one managed to reach Blackpool, which, impossible though it might appear, was one of the objectives.

Adventures there were by the dozen, and on Sunday seven of the pilots were caught in a more than usually severe blizzard and put down in various parts of the surrounding countryside. Mr. Philip Wills managed to cover some twenty-four miles in the course of this meteorological bother, and eventually put his machine down, in a slightly damaged condition, near Knutsford. Dr. W. Richardson, also of the London Club, covered thirty miles and was posted as missing for some twelve hours. He had landed at Betley, near Crewe, and the wire, which he despatched before turning in at a farm, did not reach the organisers until the following morning.

Regardless of the jeers of the unconverted, these gliding people manage to have a good deal of fun—and that, presumably, is the be-all and end-all of the pastime.

AIR-MAIL COMMENTARY

Dominica's Handsome Stamp : Rudderless French Mails : British News

ONE of the most handsome stamps that I have yet seen is the new issue from the Republic of Dominica. It has all the strength and simplicity in design of a good poster, and that, in miniature, is what a postage stamp should be.

Wording is kept down to a minimum, and two shades of blue are used for the design, which illustrates a dark aeroplane in front of massed white clouds, with mountains below.

Dominica relies for her air transport on the Pan American system, and the machine shown is a Fokker Trimotor of the type that is—or was—used by that concern.

France has been less successful in her new stamps (which incidentally, must leave Great Britain the only large country that has never produced an air-mail issue). The set includes six values from 85c. to 3fr. 50c., and Whitfield King and Co. tell me that a 50fr. is expected.

All are in the same overcrowded design, a monoplane with

The pleasing new Dominican stamp and (right) the not-so-clever French one.

One of the special covers issued by British Airways, Ltd., for their first Scandinavian mail service.

the word *Postes* on one wing flying over a minutely detailed view of Paris.

A Renault-engined Caudron Simoun, as flown on Air Bleu's internal mail services, is chosen for illustration, or, rather, for caricature, since it is rudderless.

Among British services, the first through mail flight to Nigeria started from Croydon on March 9. Letters take five days travelling from London to Khartoum and thence by the new branch to Kano, but those destined for Lagos take three days for the comparatively short Kano-Lagos stage, which is at present covered by ground transport.

A few days later, on March 14, there left Croydon the first through air mail for Hong Kong, made possible by the opening of Imperial Airways' branch line for Penang. Scant notice of this service was given in London, and I imagine that the amount of mail carried must have been small.

For neither of these services was a special cover issued by Imperial Airways, who, as already reported in *Flight*, have likewise abandoned their previous policy by refusing to handle first-flight covers on new services in future. "The company's addresses must not be used and the return to senders of any covers so received will not be undertaken," states the traffic manager. It will be interesting to see what effect this change has on the volume of first-flight mails.

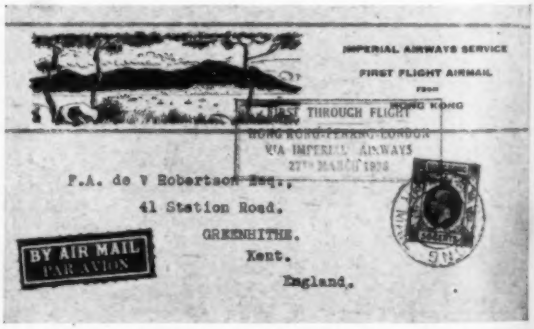
British Airways are not following the example of the older company, for they issued special coloured covers (for the first time) in connection with the opening of their unsurcharged mail service to Scandinavia.

From the Southern Hemisphere comes news of two interesting mail flights. K.N.I.L.M. carried first air mail from Soerabaja, Java, to Borneo on February 8, when a special postmark was applied. And a decorative Australian cover bears a winged N.E.A.L. badge and the comprehensive inscription: "New England Airways, Ltd. Brisbane-Townsville air mail service *via* Rockhampton and Mackay. First day official cover. 15-9-35. 'City of Grafton.'—Pilot K. A. Virtue."

Until recently, letters posted in Croydon for air transit were sent to the G.P.O., London, and thence, after sorting, back to Croydon airport. Now they go direct there from the local office, and a postmark "Croydon Surrey Air Mail" has been introduced—the first of its kind in England, outside London.

But there is still room for improvement in some of the services auxiliary to air mail. Letters for the Saturday flights to India and Australia can be posted at the G.P.O. in St. Martin's le Grand up to 10.45 a.m. on that day, but at the Old Street branch office, which is less than ten minutes' walk away, they must be posted two hours earlier.

ALEC DAVIS.



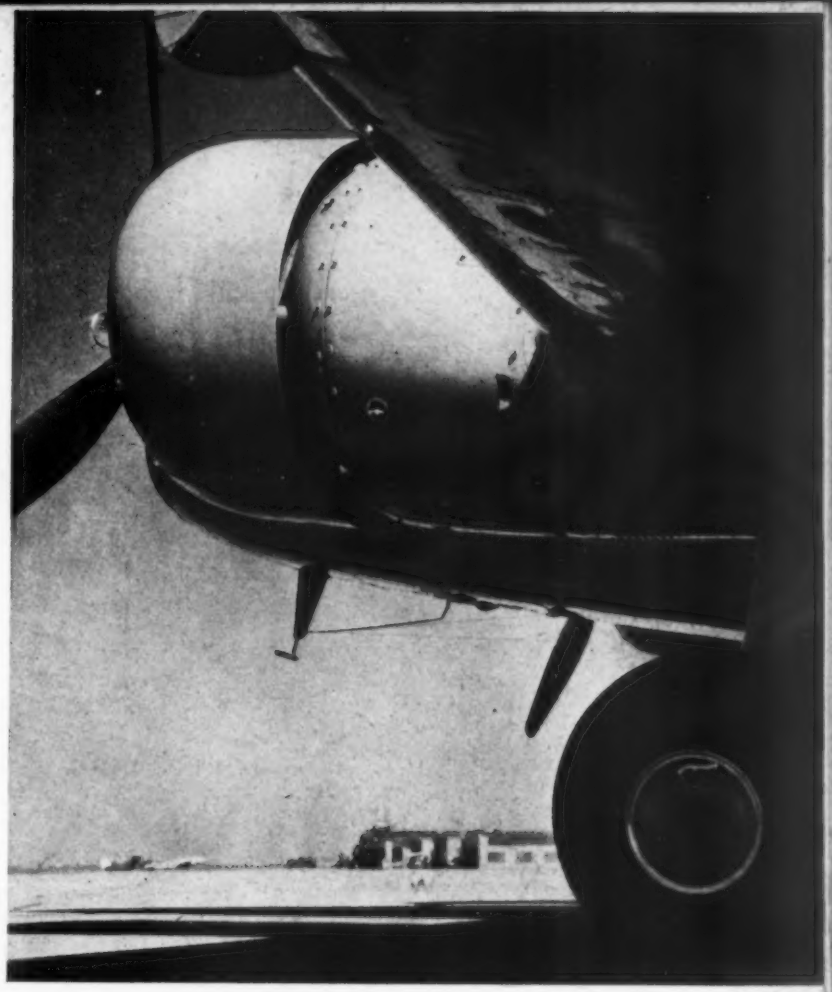
A cover carried on the first through air mail from Hong Kong, by Imperial Airways.

Forthcoming Events

April 16. R.Ae.S. (Coventry Section) Lecture: "Aircraft Instruments," by Mr. J. E. Chorlton, 8 p.m., Armstrong Siddeley Canteen.
April 17. Norfolk and Norwich Aero Club: Annual Dinner and Dance.
April 18. Brooklands Flying Club: Four-club Dinner at the Park Lane Hotel.
April 20. R.Ae.S. Lecture: "New Light on Strength of Materials Afforded by Modern Physics," by Dr. H. J. Gough, Institution of Electrical Engineers.
April 24. Bristol and Wessex Aeroplane Club: Annual Ball.
April 24. Cinque Ports Flying Club: Annual Dinner and Dance, Grand Hotel, Folkestone.
April 28. R.Ae.S. Students' Section Lecture: "Application of Aerodynamics to Mechanical Engineering," by J. L. B. Jones, 7 p.m., R.Ae.S. Library.
May 2-3. *Pou-du-Ciel* Rally, Broadway, Worcestershire.
May 10. R.Ae.S. Garden Party, Great West Aerodrome, Harmondsworth.
May 15-June 1. Stockholm Aero Show.
May 23. Empire Air Day.
May 27-June 4. Austrian Aero Club: Whitsun Tour
May 29-June 2. Swiss Aero Club: Whitsun Tour.
May 30-June 1. Isle of Man Air Races.
May 30-June 1. Aero Club de Provence: Marseilles Week-end.
May 30-June 2. Yorkshire Gliding Club: Open Meeting and Competitions.

COWLING and COOLING

—of Air-cooled Engines : Part I. : Past Difficulties in Reconciling Efficient Cooling and Low-Drag Cowling : Introduction of Modern Methods

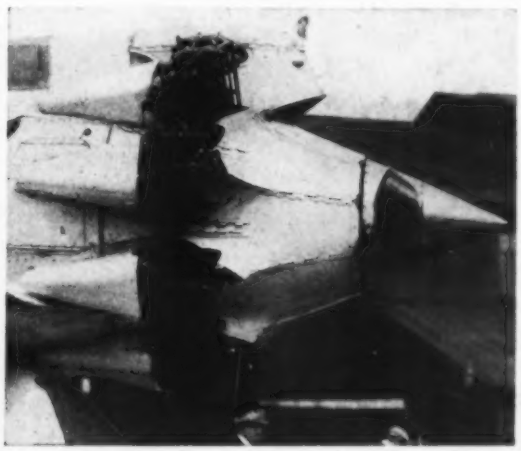


Much pioneer work has been done in the U.S.A. with the enclosing of geared and supercharged engines in long-chord cowlings. This view shows the mounting of one of the 550 h.p. Wasps in a Boeing 247-D.

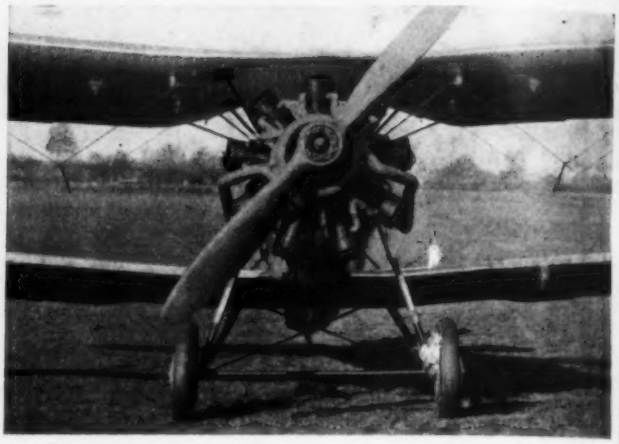
TO modern eyes one of the most striking features of many pre-war and war-time aeroplanes with rotary engines is the modern appearance of their engine cowlings. It was customary in those days to surround, or partially surround, the engine with a sheet-metal hood embodying a lip which curved over the front of the cylinders and left an opening of comparatively small diameter. This resulted in something suggestive in appearance of our modern deep-chord cowlings. Its main duty, however, was to prevent the blinding of the crew by oil from the whirling engine. In later days large spinners were added in certain cases, being particularly favoured by the Germans in the comparatively rare instances where they employed a rotary power plant. The little Le Rhone-engined Bristol single-seater fighter monoplane had one which was so large as to preserve the lines of the fuselage. There was a small circular hole cut in the spinner forward of the airscrew hub and a small gap between the spinner and the fuselage cowling in addition to the usual cut-away portion in the lower part of the latter.

The stationary engines of the same period were usually of the vee type, and when driving pusher propellers at speeds, say, below 60 m.p.h., were prone to gross overheating. The vee-type Renault—the first stationary air-cooled engine to be fitted with a cowling—was supplied with a fan delivering air through a system of ducts. When this unit was installed in tractor machines it was found possible to omit the fan and to rely on the forward motion of the machine to induce cooling air into a system of ducts or a scoop mounted over the space between the cylinder banks.

Since the war the preponderance of the radial in the



"Helmets" gave a good aerodynamic improvement, but bad cooling. The Lynx-engined Blackburn Lincock (left) was one type equipped experimentally. The Short Crusader racing seaplane (right) had its Bristol Mercury similarly cowled. Only one "helmet" is shown in place here. (*Flight* photographs.)



medium- and high-powered air-cooled engine categories has been marked. The great difficulty experienced has been to cowl this type of engine so that it offers as little resistance as possible and yet keeps cool. Many and varied installations have been tried. When a radial engine was mounted in the nose with no cowling whatever the fuselage was given an exceedingly poor entry. Sometimes—notably in installations of the A.B.C. radials produced towards the end of the war—smooth, rounded cowling was fitted over the crank case and continued back between the cylinders into the main fuselage cowling. This arrangement was further developed, provision being made for an airscrew spinner whose lines blended into a crank case cover. This, in turn, merged smoothly into the fuselage. The complete installation looked reasonably attractive from the aerodynamic viewpoint, but, in effect, the projecting cylinder heads set up such eddying that the results were not so encouraging as might well have been supposed.

Yet another interesting cowling system was applied to the Bristol F.I. single-seater fighter, which was about to be put into production when hostilities ceased. The 315 h.p. Cosmos Mercury nine-cylinder radial of this machine was supplied with something which looked like a modern deep-cord cowling, but in which were cut-outs to receive the cylinder heads. The "mouth," although of comparatively small diameter, was much larger than that of the airscrew hub, and admitted cooling air to the cylinder barrels.

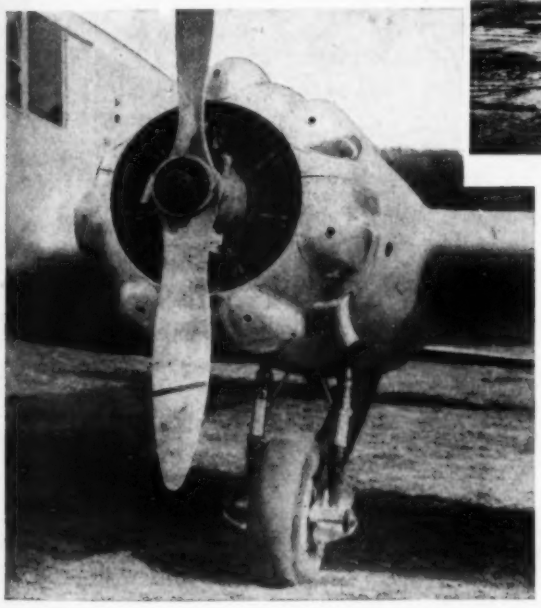
A different method was tried on the Boulton and Paul Bourges

A few Bristol installations (reading from top): Bulldog (Jupiter VI with cylinder "tails" and exhaust collector blending into spinner); Bulldog IV (Mercury IV with separate exhaust collector and Townend ring); Bulldog IV (Mercury VI S with combined exhaust collector and Townend ring); Bullpup (sleeve-valve Aquila with combined long-chord cowling and Townend ring). Top right: Bulldog IV (showing Perseus sleeve-valve engine uncowled), and (below) the complete scalloped cowling on the same machine.

bomber. This machine was fitted with a pair of A.B.C. radials in nacelles between the wings. The engine cowling merged into the tail of the nacelle to form a well-shaped body almost equal in diameter at its maximum cross-section to the engine itself. Nine pockets—one for each cylinder—were recessed into the cowling, the cylinder heads being open to the airstream. The arrangement never passed into general use.

A later development was the fitting of "tails" or fairings behind each cylinder of a radial, but their efficacy was small. The present Service-type Bulldog IIA fighter with Jupiter engine has its power plant cowled after this fashion, the crank-case cover being formed by the exhaust collector ring. Small inter-cylinder fairing panels are fitted between the exhaust collector ring and the main fuselage fairing.

Some years ago a number of firms attempted to encase the projecting cylinders in helmets, each with a very small aperture in front to admit the cooling air. On certain machines built purely for speed (including the Short



A combination of "helmets" with modern long-chord cowlings is a feature of the Avro Anson (Cheetah IX's).

Crusader racing seaplane and the French Gourdou Lesseurre monoplane) this arrangement gave reasonably good results—certainly better than those obtained with any other contemporary arrangement—but for everyday use it was ruled out because of inadequate cooling and inaccessibility.

With speeds constantly on the increase the high drag of the radial became more and more apparent. It is only within the last eight or nine years that the introduction of the Townend ring and the N.A.C.A.-type cowlings have offered a very great reduction in drag, at the same time retaining acceptable cooling characteristics. Engines themselves, of course, have had to be adapted to the new cowling technique. This fact, in conjunction with the introduction of gearing and supercharging, has resulted in deeper and more closely spaced fins on the cylinders.

Perhaps the greatest contribution made by Great Britain toward the efficient cowling of radials is the Townend ring,

A close-up of the nose of the Blackburn Shark showing how the 760 h.p. 14-cylinder Tiger is fitted with the long-chord Siddeley cowling. (*Flight* photograph.)

introduced by Mr. H. C. H. Townend, B.Sc., A.F.R.Ae.S.

Model tests show that a nine-cylinder radial engine could increase the drag of a streamline body to as much as five times that of the body alone. Even a five-cylinder engine could increase it to three times the original figure. These results spurred the National Physical Laboratory, where Mr. Townend was working, to develop the ring.

It was found during experiments that the cylinders of a radial normally deflected the air outward, forming a broad turbulent wake. An annular aerofoil placed round the cylinders exerted an opposing, inwardly directed deflection on the airstream, preventing this breaking-away and maintaining a greater degree of smoothness in the flow. The reaction on the ring may be regarded as a radial "lifting" force tending to burst it outwards and having an axial component in a forward direction tending to push the ring toward the nose of the machine.

Some outstandingly good results were obtained soon after the introduction of the ring. A Vickers single-seater fighter with a Bristol Jupiter XF geared engine had its maximum speed increased by 12 m.p.h., bringing it to 191 m.p.h. at 12,000ft. A Boulton and Paul Sidestrand twin-engined day bomber increased its speed from 154 m.p.h. to 167 m.p.h. at 12,000ft. The ring also proved itself very effective on two-row engines, and added 7 or 8 m.p.h. to the speed of the Armstrong Whitworth Siskin fighter with fourteen-cylinder Jaguar engine.

Experience showed that for rings of the usual single-surface or plate type a camber of about 10 per cent. of the cord length was desirable.

The licence for the Townend ring was acquired by Boulton and Paul, Ltd., who proceeded with its development. They embodied in the nose of certain rings annular exhaust collectors (the Sidestrand mentioned was fitted with this type) and made others of polygonal form. Tests with a streamline nacelle showed that the drag with a polygonal ring was slightly less than with a circular type.

(*To be concluded next week.*)

OUT of the PAST

Two Historical Machines, a Sopwith Camel and a Pre-war Farman, Being Resurrected by a Brooklands Enthusiast

By W. BODDY

A Farman biplane of the type acquired by Mr. R. G. J. Nash.

EACH November, for some years past, owners of "historic" motor cars have competed in the very sporting Commemoration Run from London to Brighton, now organised by the R.A.C., and formerly held at the suggestion of a daily newspaper with the co-operation of *The Autocar*. Last November over ninety veterans took part in this contest. Most of these historic cars have been unearthed in the most unlikely places and then restored as nearly as possible to original condition by their enthusiastic owners.

Now it would seem that a similar enthusiasm for unearthing and restoring historic specimens from the past is developing in aviation circles. *Flight* has already described (November 7, 1935) the cross-Channel Bleriot which R. O. Shuttleworth is thoroughly restoring at his Biggleswade aerodrome. Now comes news that Richard G. J. Nash, who is well known as an enthusiastic collector of old bicycles and "period" motor vehicles, as well as a successful driver of small racing cars in sprint and hill-climb contests, has added two early aeroplanes to his collection, which is gathered together at a shed on Brooklands aerodrome.

War and Pre-War

One of these machines is a Sopwith Camel of 1917 vintage, with 140 h.p. Clerget engine, which is being reconditioned and restored to war-time condition.

The second acquisition is a 1912-13 Farman pusher-biplane, which before the war was the personal machine of M. Maurice Farman. It is powered with a 130 h.p. twelve-cylinder Renault engine.

Mr. Nash plans to fly these machines. He will hire them out to film producers, and fly them at exhibitions and club displays.

Naturally, there will be some who will consider that such historically priceless machines should, when restored, be put safely away in a museum. Against that it can be argued that while the Veteran Car Run is primarily a sporting matter for the competitors, nevertheless very large numbers of persons are enabled to see the veterans in action and thereby appreciate very vividly the progress that has been achieved, and a moving procession is far superior to a stationary museum exhibit in this respect. So it is with antique aeroplanes, and, provided that such machines are seriously restored to original condition as far as is possible and are subsequently flown seriously and not regarded merely as an amusing "stunt," then their acquisition provides sport and interest unrivalled by any other kind of antique collecting.

However, the way of the would-be historic aeroplane collector will be by no means straightforward. Whereas the old-car enthusiast can come to very little harm if he remembers the inadequate roadholding and primitive braking of his possession, a pre-War flying machine can be a very adventurous proposition, not only on account of the difficulty of ascertaining the condition of every part of the air frame, but also on account of peculiarities of control and flying characteristics.

Again, although aviation is younger than motoring, there must be very, very few genuine old machines still in existence. The Air Ministry list of aeroplanes registered on December 31, 1934, shows that there were then only a few pre-1918 machines on record, and not a solitary Sopwith or Farman was on the list.

It will, at all events, be interesting to see if any other veterans are unearthed this year and how Mr. Nash's examples take to the air. Incidentally, if interest grows, there is likely to be a furious demand for early volumes of *Flight*.

EMPIRE AIR DAY: CIVIL AERODROMES

IN addition to the list of nearly fifty R.A.F. stations which will be open to the public on Empire Air Day, Saturday, May 23 (given in *Flight* of March 26) it is now possible to disclose the names of twenty-three civil aerodromes which to date have also promised to give facilities. They are:—

London and Home Counties

Middlesex: Heston Airport, Hounslow (Airwork, Ltd.); Hanworth Aerodrome, Feltham (The London Air Park Flying Club, Ltd.).
Hertfordshire: Hatfield Aerodrome (De Havilland Aircraft Co., Ltd.).
Kent: Gravesend Airport (Airports, Ltd., Airworthiness, Ltd.); Bekesbourne Aerodrome, Canterbury (Airsales and Service, Ltd.).
Surrey: Redhill Aerodrome (British Air Transport, Ltd.).
Sussex: Brighton, Hove and Worthing Airport, Shoreham-on-Sea; Ford Aerodrome, Yapton (Yapton Aero Club, Ltd.); Wilmington Aerodrome (Eastbourne Flying Club, Ltd.).

Provincial

Cheshire: Merseyside Air Park, Hooton.
Cambridgeshire: Fen Ditton Aerodrome (Marshalls' Flying School).
Cumberland: Carlisle Municipal Aerodrome, Kingstown, Carlisle.
Gloucestershire: Bristol Airport.
Hampshire: Hamble, Southampton (Air Service Training, Ltd.); The City Airport, Portsmouth (Portsmouth Aero Club, Ltd.).
Lancashire: Airport of Manchester, Barton (Airwork, Ltd.).
Norfolk: Norwich Municipal Aerodrome (Norwich and Norfolk Aero Club, Ltd.).
Northumberland: Woolsington, Newcastle-upon-Tyne (Newcastle-upon-Tyne Aero Club, Ltd.).
Warwickshire: Castle Bromwich, nr. Birmingham (Midland Aero Club).
Yorkshire: Leeds-Bradford Municipal Aerodrome, Yeadon, nr. Leeds (Yorkshire Aeroplane Club, Ltd.).

Scotland

Ayrshire: Prestwick Aerodrome (Scottish Aviation, Ltd.).
Perthshire: Perth (Airwork, Ltd., Reserve Training School).

Northern Ireland

Co. Down: Ards Airport, Newtownards. (If Club is open.)

THE ROYAL AIR FORCE

SERVICE NOTES AND NEWS — AIR MINISTRY ANNOUNCEMENTS

AIR MINISTRY APPOINTMENTS

The Air Ministry announces:—

The Rt. Hon. Viscount Swinton, P.C., G.B.E., M.C., Secretary of State for Air, has appointed Mr. P. J. Oldfield to be his Principal Private Secretary in succession to Mr. C. J. Galpin, D.S.O., who has been promoted to be a Deputy Director of Civil Aviation.

Mr. A. H. Self to be a Principal Assistant Secretary.

Two further promotions have been approved to take effect later in the year in connection with pending retirements:—

Mr. L. V. Meadowcroft to be Director of Contracts (ranking as a Principal Assistant Secretary).

Mr. J. B. Abraham, C.B., to be a Principal Assistant Secretary.

No. 20 SQUADRON REUNION

The reunion dinner of No. 20 Squadron, R.A.F., will be held on April 25. Details can be obtained from F. C. Collinson, 40, Norcott Road, Stoke Newington, N.16.

No. 8 SQUADRON REUNION

A reunion dinner of the Royal Naval Air Service Unit in East Africa (No. 8 Squadron) from 1916 to 1918 will take place at Pritchard's Restaurant, 79/81, Oxford Street, London, W.1, on April 24 next, at 7 p.m. Air Marshal Sir F. W. Bowhill, K.C.B., C.M.G., D.S.O. (erstwhile C.O. of No. 8 Squadron) hopes to be present. All members of the Squadron are heartily invited to attend and are asked to get into touch with Capt. C. S. Thompson, 83, Upper Thames Street, London, E.C.4.

PROMOTION EXAMINATIONS

Promotion examinations "B" and "C" will be held on September 8, 9, 10 and 11, 1936.

FOREIGN OFFICER ATTACHED

Lt. G. A. Westring of the Swedish Air Force has been attached to the R.A.F. Station, Mildenhall, from April 1 for a period of two months.

SKILL-AT-ARMS

H.R.H. The Duke of York has graciously consented to present twelve skill-at-arms certificates for the competitors who are placed 1st, 2nd and 3rd in foil, epée, sabre and bayonet competitions at the Royal Tournament.

THE ROYAL TOURNAMENT

A feature of the Royal Tournament at Olympia (May 7-23) will be a display by recruits from the Royal Air Force Depot, Uxbridge, and will show the standard of physical fitness attained after three months' Service training. It will consist of a series of free standing exercises calling for agility, rhythm, and suppleness of body; exercises with human support; and figure marching in double time. Although the exercises have been set to music and arranged in display form, the actual exercises are taken from the recruits' training tables.

The Royal Air Force Band will be present, and the display will be under the direction of Group Capt. A. H. Jackson, Commandant of the Royal Air Force Depot, Uxbridge.

AIR FORCE LIST

The April issue of the *Air Force List* has now been published. It can be purchased (price 2s. 6d.) from H.M. Stationery Office at the following addresses: Adastral House, Kingsway, London, W.C.2; 120, George Street, Edinburgh; 2, York Street, Manchester; 1, St. Andrew's Crescent, Cardiff; 15, Donegall Square, Belfast; or through any bookseller.

R.A.F. BENEVOLENT FUND

The Royal Air Force Benevolent Fund Annual Report for 1935 discloses a total expenditure upon relief alone of £18,786, while donations from all sources, including the Royal Air Force Displays and Empire Air Day amounted to £16,603.

The examples of cases helped are evidence of the special calls made upon the Royal Air Force in peace as well as war, and the Fund, upon which the dependents of officers and airmen killed flying are a first charge, offers to all a medium for sympathy in practical form. The figures of expenditure and of donations are the highest yet reached, and even greater work must lie ahead owing to the expansion of the Royal Air Force. The Council record with gratitude the support so graciously given by their President His Royal Highness The Duke of York and Her Royal Highness the Duchess, and the receipt amongst others of gifts amounting to £1,000 from Lord Wakefield, the Chairman of Council.

The Council in their report give details of the valuable work being done at the School for the sons of deceased airmen at Vanbrugh Castle, which was a gift from Mr. Alexander Duckham.

The usual meeting of the Grants Committee was held at Iddesleigh House on April 6. Mr. W. S. Field was in the chair, and the other members present were:—Mrs. L. M. K. Pratt Barlow, O.B.E., Air Comdre. B. C. H. Drew, C.M.G., C.B.E., Group Capt. C. H. K. Edmonds, D.S.O., O.B.E., Air Vice-Marshal C. A. H. Longcroft, C.B., C.M.G., D.S.O., A.F.C. The Committee made grants to the amount of £404 12s. 1d. The next meeting was fixed for April 20.

OLD AND NEW UNIFORMS: The changes announced in R.A.F. uniform, discussed in a leading article in *Flight* last week. The four figures above show from left to right: (1) the old uniform, (2) new working dress, (3) dress for ceremonial, (4) new uniform with gaiters.

GRANT OF PERMANENT COMMISSIONS

The undermentioned short service and medium service officers have been selected for appointment to permanent commissions in the general duties branch:—

Flight Lieutenants.—Desmond John Alvey, Leslie Harold Anderson, Eric Cecil Bates, John Kenneth Brew, Harry Broadhurst, James Arthur Sherman Brown, Nevile Raby Buckle, Reginald Chadwick, Hurll Fontayne Chester, Robert Alexander Chignell, Reginald John Clare Hunt, Anthony Roland Collins, Montague Cecil Collins, John Constable-Roberts, Joseph Cox, Peter Dicken Cracroft, A.F.C., Kenneth Brian Boyd Cross, Bertram Arnold James Crummy, Rupert Stanley Darbyshire, Arthur Meuric Nairne David, Edward Jonathan Palgrave Davy, Robert Cecil Dawkins, John Goodenough Elton, A.F.C., John Bernard Fyfe, D.F.C., Robert Frank Gandy, Edward John George, Douglas McCaul Gordon, Edward Gerard Granville, Selwyn Harmer Cecil Gray, Frederick Walter Hick Hall, Richard Claude Hancock, Roland Gustave Harman, William Richard Hartwright, Philip Haynes, Neville Charles Hendrikz, George Kenneth Horner, Noel Challis Hyde, Gerald Barnard Keily, Rex Laughton Kippenberger, Ronald Beresford Lees, Charles Rochford Lousada, Arthur Noble Luxmoore, Terence John MacDermot, George Peter Macdonald, William Mary Laurence MacDonald, Andrew McKee, Austin Flower McKenna, Herbert Waldemar Mermagen, Alan Cunningham Mitchell, George Rodgers Montgomery, Cyril Ernest Morse, Richard Rupert Nash, Norman Cyril Odbert, Henry Eustace Power, Henry Neville Gynes Ramsbottom-Isherwood, William Arthur

Richardson, George Edward Sampson, Anthony George Carl Somerhough, Reginald William Kennedy Stevens, Victor Charles Frederick Streatfeild, Alexander Edward Taylor, Wilfred Peter John Thomson, Reginald Bryson Wardman, Walter George Woolliams, Peter William Mellor Wright.

Flying Officers.—Roy George Claringbould Arnold, George Arthur Bartlett, Henry Gordon Blair, Alan McDonald Bowman, Follett Berkeley Bristow, Waverley Edward Cameron, Graham Routh Canavan, Richard Charles Marler Collard, Eric Alfred Douglas-Jones, Michael Harington Dwyer, Walter Nigel Elwy-Jones, Frank Steight Gardner, Arthur Harold Garland, Thomas Percy Gleave, John Graeme Glen, Alan Dennistoun Grace, Henry Rudolph Graham, John Grandy, Peter Hoare Hamley, William Pearce Harvey, George William Heather, Reginald Henry Hobbs, Ian Victor Hue-Williams, John William Arthur Hunnard, Philip Algernon Hunter, Geoffrey Twyford Jarman, John Wesley Boyd Judge, Edward Vincent Knowles, Thomas Frederick Umphelby Lang, Jack Cuthbert Larking, Ralph Noel McKern, Alfred Hardwicke Marsack, Dudley Hardwicke Marsack, Alan Cresswell Martin, Alister William Stewart Matheson, Guy Lambton Menzies, John Douglas Miller, Herbert Pilling, Ronald Arthur Ramsay Rae, David Wilson Reid, Francis Cecil Seavill, Sidney Ernest Roger Shepard, Frederic William Charles Shute, Frank George Laughton Smith, Duncan Macdonald Somerville, Robert Sorel-Cameron, George Edward Strangman, Lancelot Francis Jameson Taylor, Arthur William Vincent, John Mortimer Warfield, James Owen Willis, George Peter Woodhouse.

ROYAL AIR FORCE GAZETTE

London Gazette, April 7, 1936

General Duties Branch

The following are granted short service commissions as Acting Pilot Officers on probation with effect from and with seniority of March 23:—R. J. Abrahams, R. A. Barton, D. E. Bell, J. C. Betts, T. D. B. Blake, A. O. Bridgman, P. M. Brothers, J. H. D. Chapple, C. L. F. Colmore, J. A. Coltart, N. G. Cooke, D. H. Cross, K. D. Currie, L. S. Dawson, A. L. Doran, N. F. Eagleton, E. C. S. Fewtrell, R. W. Gautrey, J. Gillan, G. R. E. Gregory, L. G. Hamer, G. Harris, B. P. Hart, E. A. Keegan, J. S. Liard, C. J. C. Lee, M. V. Longbottom, J. A. Mackie, I. G. C. Malcolm, S. T. Meares, D. R. Miller, S. J. Monroe, J. L. Nicol, D. F. O'Mahony Leahy, A. W. Pennington-Legh, E. F. Pope, K. J. Powell, W. S. Pryde, A. H. Rawson, H. à'B. Russell, A. S. K. Scarf, W. T. C. Seale, H. L. Smeddle, R. D. Speare, C. A. Stephen, J. D. Stern, A. W. M. Street, P. D. J. Strong, J. R. Sullivan, C. D. Swain, J. G. Theilmann, B. J. Thomas, N. M. Thomas, T. R. Thomas, J. P. Wells, R. H. Weston, E. R. White, W. K. Williams, E. C. Wolfe.

The following Flying Officers are promoted to the rank of Flight Lieutenant on the dates stated:—A. W. S. Matheson (October 28, 1935); W. A. J. Satchell (January 1); J. A. Tester, A. H. Garland, C. G. Skinner (March 12); J. N. Jefferson (March 26).

The following Pilot Officers are promoted to the rank of Flying Officer on the dates stated:—T. G. Young (March 29, 1935); A. R. D. Macdonell, C. L. Y. Wright (January 28); G. J. D. Thomson, A. P. W. Cane (March 1); C. A. H. Evans (March 2); D. D. Atkinson (March 6); C. F. Sarsby (March 22); B. V. Robinson (April 1).

P/O T. F. Barker relinquishes his permanent commission on account of ill-health (April 6).

Accountant Branch

Flt. Lt. E. W. Horncastle is promoted to the rank of Squadron Leader (April 1).

Dental Branch

The following are granted non-permanent commissions as Flying Officers for three years on the active list with effect from March 9, and with seniority of the dates stated:—O. F. Brown (October 1, 1935); I. St. C. Alderdice, J. H. G. Fensom, S. Hill, R. A. Pepper, W. A. H. Smith (March 9).

Commissioned Armament Officer

W/O. A. J. Richardson is granted a permanent commission as Flying Officer on probation with effect from March 23 and with seniority of March 18. (Substituted for the notification in the *Gazette* of March 31.)

Errata

In the *Gazette* of March 10. For George Harus Sheehan read George Harcus Sheehan. In the *Gazette* of March 31. For Francis William Aggett read Francis William George Aggett.

ROYAL AIR FORCE RESERVE

Reserve of Air Force Officers

General Duties Branch

F/O. C. W. Staveley is granted the honorary rank of Flight Lieutenant while serving with the Royal Air Force as a civilian assistant (March 5).

The following Pilot Officers are promoted to the rank of Flying Officer on the dates stated:—R. E. Stevenson (February 1); J. A. Mortimer (February 7); W. L. Stranger (February 8); N. W. Burnett, H. L. Cruickshank, D. W. Donaldson, J. S. Hall, M. Horan, L. A. Howard, J. F. Inkster, P. H. Lewis, H. F. Morley, K. T. Murray, P. E. Rees, J. L. J. Rowland, W. H. M. Walker, G. Watson, J. D. Wood (February 13); C. G. Holland-Martin (February 22); F. D. Paul (February 25); M. R. Macarthur (March 1).

The following Flying Officers relinquish their commissions on completion of service:—R. P. D. Brailli (March 6); E. W. Spilman (March 16).

F/O. J. R. Wemyss relinquishes his commission on appointment to a commission on the Unattached List for the Indian Army (March 14); P/O. R. W. Gautrey relinquishes his commission on appointment to a short service commission in the Royal Air Force (March 23).

SPECIAL RESERVE

General Duties Branch

Flt. Lt. the Hon. H. C. H. Bathurst relinquishes his commission on completion of service (February 23).

AUXILIARY AIR FORCE

General Duties Branch

No. 601 (County of London) (Fighter) Squadron.—The following Pilot Officers are promoted to the rank of Flying Officer.—J. H. Little (March 15); M. F. Peacock (November 29, 1935).

No. 604 (County of Middlesex) (Fighter) Squadron.—Pilot Officer S. H. Skinner is promoted to the rank of Flying Officer (March 16).

Stores Branch

Flt. Lt. W. B. Frederick (R.A.F. Retired) is granted a commission in that rank (February 28).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Air Vice Marshal.—W. R. Freeman, C.B., D.S.O., M.C., to Air Ministry; on appointment as Air Member for Research and Development, vice Air Marshal Sir H. C. T. Dowding, K.C.B., C.M.G., 1.4.36.

Squadron Leader.—J. L. Wingate, to Special Duty List; whilst employed on Armament duties at the Royal Aircraft Establishment, South Farnborough, 1.4.36.

Flight Lieutenants.—C. H. Brill, to No. 214 (B) Squadron, Andover, 30.3.36. R. Harston, to D.D.R.M., Dept. of A.M.R.D., Air Ministry, 1.4.36. J. B. T. Whitehead, to No. 9 Flying Training School, Thornaby, 30.3.36. H. B. Wrigley, to R.A.F. Station, Mount Batten, 1.4.36. D. V. Ivins, to H.M.S. *Courageous*, 6.4.36.

Flying Officers.—A. H. Button, to No. 9 Flying Training School, Thornaby, 1.4.36. H. P. Burwood, to Anti Aircraft Co-operation Flight, Biggin Hill, 1.4.36.

Acting Pilot Officers.—The undermentioned are posted to R.A.F. Depot, Uxbridge, on appointment to short service commissions as Acting Pilot Officers on probation with effect from 23.3.36:—J. A. Coltart, A. L. Doran, C. J. C. Lee, A. W. Pennington-Legh, A. S. K. Scarf, P. D. J. Strong, J. G. Theilmann, A. O. Bridgman, G. Harris, R. D. Speare, L. S. Dawson, P. M. Brothers, L. G. Hamer, W. S. Pryde, H. à'B. Russell, W. T. C. Seale, H. L. Smeddle, J. R. Sullivan, E. C. Wolfe, S. T. Meares, K. J. Powell, J. P. Wells, T. D. B. Blake, E. C. S. Fewtrell, E. A. Keegan, D. R. Miller, J. D. Stern, R. A. Barton.

Stores Branch

Pilot Officers.—K. T. Nicklin, to Air Armament School, Eastchurch, 1.4.36. C. J. Salmon, to No. 2 (Army Co-operation) Squadron, Hawkinge, 1.4.36. W. J. Stutchbury, to No. 4 Stores Depot, Ruislip, 1.4.36. M. C. R. White, to No. 13 (Army Co-operation) Squadron, Old Sarum, 1.4.36.

Accountant Branch

Pilot Officer.—W. G. Thorn, to Headquarters, R.A.F., Cranwell, 1.4.36.

Dental Branch

Flight Lieutenant.—A. Maben, to R.A.F. Hospital, Aden, 28.3.36.

Earthbound Streamlining

AT the next meeting of the students' section of the Royal Aeronautical Society, on April 28, Mr. J. L. B. Jones, of the research staff of the L.M.S., will read a paper on "The Application of Aeronautical Research to Mechanical Engineering." It will deal with the important work which has been done in the streamlining of rail and road vehicles on aircraft lines.

All who are interested in the subject are invited to attend and join in the discussion. The lecture will be given in the R.Ae.S. Library, 7, Albemarle Street, London, W.1, at 7 p.m.

COMMERCIAL AVIATION

— AIRLINES — AIRPORTS —

DUPLICATED : Latest of the British Aircraft Manufacturing Company's developments, the Double Eagle is eventually likely to be of considerable interest to the smaller air line or charter operator. The pilot has a very good view in all essential directions and, with the low-middle-wing arrangement, the passengers, too, will be able to take an interest in earthly matters. The engines are Gipsy Majors. (*Flight* photograph.)

THE WEEK AT CROYDON

The Higher the Fewer : A Record Easter : Real Weather Prophets : More Queer Cargoes : A Spot of Static

THE Easter rush by air has been heavier than ever before, and, despite the cold weather, there have been large crowds of visitors at the Airport. There were more than a hundred Channel crossings on Thursday and Friday, every machine available being pressed into service, and many machines made several crossings.

Pilots reported that the Brighton road seen from above was one continuous line of black car roofs, and, though "the higher the fewer" still held good as a slogan for air travel, there was quite enough air traffic to keep the control tower staff continuously busy. There was quite a lot of joy-riding, too, and Joe Chamberlain, of Surrey's—the infinite variety of whose witty appeals to the public "years cannot wither, nor custom stale"—was at it all day long. Olley Air Service had its whole fleet busy, mostly to and from Le Touquet, but with other flights as well, including one to Vienna with a party of Americans, and another to Le Havre.

Full Loads

British Continental Airways had quite a busy time, too. The Scandinavian machine was seen to leave Croydon with a full load on one day of the holidays, and there was also a full load on the Lille service both out and home. Among the "specials," one, piloted by Capt. Crundall (now of B.C.A.), left for Paris, whence he flew it to Le Havre to pick up another party. From Le Havre he carried on to Liverpool with people from a liner, one of whom was an invalid, and a radio call *en route* ensured special road transport at Speke. After this Capt. Crundall returned to Croydon. It is gratifying to know that, despite the difficulties placed in the way of companies such as B.C.A. and British Airways, passengers and freight are slowly but surely being won for these lines against almost overwhelming odds. [An "Outlook" paragraph on this subject appears on page 393.—ED.]

Evidently the dailies were not satisfied with the official Easter weather forecasts, for several of them telephoned Croydon to ask for the opinions of some of the more experienced pilots. These men have acquired an instinct for weather that no rain gauge and slide-rule wizard in an Air Ministry office can hope to equal in certain weather circumstances, and I am told that the pilots' forecasts, though couched in racy language, turned out to be fairly accurate.

Ornithological

The season for plovers' eggs is now in full swing. They come mainly from Holland, and K.L.M. has a list of "customers," since these somewhat gelatinous dainties may not be sold in this country. Another queer cargo, also from Holland, came in last week. It was a single consignment, valued at about £125, of rare, colourful birds such as Blue Mocking birds, Cedar Wanwings, Cuban Tanagers, Orange Winged Blackbirds, Orange Weavers, Rainbow Buntings, and the like. Some of these birds are said to be worth £5 or more a pair. There were also some Toucans, and you know what Toucan do. But do you know what two *Touracos* could do with the well-known form of nourishment? I ask because there were several of these amongst the consignment, and maybe these will form the basis of some experiment by Dr. Strabismus (whom God preserve).

Commercial Aviation

The spot of static electricity encountered by Capt. Scott with the Imperial machine *Dione* was a heaven-sent opportunity for some papers when taken in conjunction with the story of a Jersey Airways machine which was also said to have been struck by lightning. Headlines containing the words "drama" and "thrill" appeared all over front pages like a spring rash on a very young reporter's countenance. There is little or no danger with static electricity when in the air, but it certainly does very queer things to compasses, which seldom or never recover. When you have filled your aeroplane with directional gyros and all manner of radio devices, the compass is still the foundation of all navigation, so that "static" remains a problem if not an actual danger. A. VIATOR.

Plymouth-Jersey

ON Tuesday of last week Jersey Airways inaugurated their Plymouth-Jersey service, which will be operated twice weekly. One or two experimental services, it will be remembered, were run last year.

The Empire Boats

PROVISIONAL duties have, it is learned, been assigned to the first three of the twenty-eight Short boats which are being made for Imperial Airways.

When the trials have been completed this summer, the first will be used on the Mediterranean route; the second will make several long-range flights preparatory to experimental Atlantic crossings; and the third will be shipped to America, where it will eventually share the New York-Bermuda service with the P.A.A. machines.

Advances at Aberdeen

SINCE April of last year Aberdeen Airways have laid out three aerodromes at Thurso (Caithness), Stromness (Orkney), and on the island of South Ronaldsay, which has not previously been on the air map. The company, of course, also has its own aerodrome at Kirkwall.

On April 13 Aberdeen Airways were due to open a daily service between Aberdeen, Thurso, South Ronaldsay and Stromness. Landing grounds have been secured at St. Andrews and North Berwick for a service across the Firth of Forth; which is to be operated this summer, while in June a twice-weekly service between Aberdeen and Hull will be opened. It will be remembered that the original plan was to fly daily between Aberdeen, Newcastle, Hull and London.

The Aberdeen-Edinburgh service suffers from the fact that there is, as yet, no civil aerodromes within easy reach of the latter city, and the charges at Turnhouse are, naturally enough, fairly heavy.

Going Abroad

A NUMBER of interesting orders have been placed with the De Havilland Aircraft Company during the past month or two, thus adding to the already handsome list of operators, both at home and abroad, who are using various types of D.H. aircraft.

As already announced in *Flight*, an order for three machines has been placed by the Turkish State Airways. An arrangement has been made with Air France whereby the Turkish Government are responsible for carrying the mail on the Indo-China service from Istanbul to Aleppo, *via* Ankara and Adalia, and it is for this purpose that the 89s have been acquired. Seating accommodation is provided for seven passengers, while a separate luggage compartment has been arranged at the rear of the cabin with an external loading door. Full wireless equipment, consisting of the R.T.E. Radio AC45 receiving and transmitting and the RC.35 D/F apparatus, is to be fitted.

The Imperial Iranian War Ministry have also ordered three Rapides and these machines will be used on internal lines radiating from Teheran. Accommodation is provided for five passengers with a pilot and radio operator.

Yet another Rapide purchaser is the Adelaide Steamship Company, which has ordered two for their subsidiary company, Adelaide Airways. These machines will be used on the routes between Adelaide and Melbourne, Broken Hill and Port Lincoln. The machines are arranged to carry a pilot and eight passengers, with a small freight compartment.

A single Rapide has also been ordered by the Aeroput, the Yugoslavian company, to augment their existing equipment. In this there will be accommodation for eight passengers and full Marconi radio equipment is to be provided.

Altogether, no fewer than seventeen operators, at home and abroad, are now using D.H. Rapides, while another ten are using D.H.86s. These figures do not include the six oil companies who use Dragon Rapides for the transportation of material and personnel, or for survey work.

A New Aero Engine

TESTS have been carried out recently at Heston on a new Villiers Hay engine. Of the four-cylinder inverted type, it is said to give an output of 120-130 b.h.p.

About Aerodrome Lighting

AN interesting and comprehensive catalogue of their well-known aerodrome lighting equipment has been issued by Chance Bros. and Co., Ltd., Lighthouse Works, Smethwick, Birmingham. It is divided into the following sections: floodlights, illuminated wind indicators, obstruction and boundary lights, beacons, marker lights, and air-route lighting, and miscellaneous equipment.

Heston in March

TOTALS of 2,042 private and 1,169 commercial machines passed through Heston during March, 1936. These figures compare very favourably with the corresponding figures for last year, which were 1,841 and 953 respectively.

Mr. R. I'E. Malone, of the Airwork sales department, has reached Geneva in his tour round Europe in the Percival Vega Gull. From Geneva Mr. Malone intended to fly to the Bata Shoe Company's airport at Zlin, Czechoslovakia.

Three American Tragedies

FOLLOWING so comparatively soon after American Airlines' crash in Arkansas, last week's accident to a Transcontinental and Western Air Douglas may have a regrettably damping effect on air line bookings in the U.S.

The machine was flying between Newark, N.J., and Columbus, Ohio, had been prevented by weather from making its customary call at Pittsburg, Penn., and was wrecked in the Alleghany Mountains with a loss of eleven lives. The stewardess was the only surviving member of the crew. The conditions at the time were conducive to ice-formation at certain altitudes.

On Sunday of this week three passengers of a Pan-American Airways' Sikorsky S.38 were drowned when the machine stalled into the harbour at Port of Spain, Trinidad. Apparently the pilot swerved to avoid a surface craft in the semi-darkness while he was preparing to hold off—with, consequently, very little speed in hand.

On the day previous to the T.W.A. accident an Army bomber had been wrecked in the mountains near Fredericksburg while making a short night flight. The crew of five perished.

Six Giants for Air France

THE future policy of Air France in the matter of their main trunk route—the London, Paris, Lyons and Marseilles line—can now be stated. Air France will gradually replace the existing types now used between London and Marseilles with fast, large-capacity machines capable of coping with the heavy traffic, both in passengers and freight, which is increasingly converging on that route from all directions.

The replacements will begin in a month's time, and will continue throughout the year until, before next spring, the substitution will be complete.

The machine chosen for this new departure is the Farman 224 (four Gnome-Rhone K.14's) forty-seater, which will have a top speed of 200 m.p.h. Its weight is sixteen tons, the length of the fuselage 70 feet, and the wing span 110 feet. This monoplane, which has a retractable undercarriage, is a derivative from the Transatlantic Farman Centaure, which has responded successfully to the searching test of fifteen crossings of the South Atlantic with the mail.

M. Briand, director of Air France, who was in London last week, has confirmed the details of this decision and stated that six Farman 224's had been ordered by the Company. Work is nearing completion on the first and has begun on the second. The first flight is expected to be made in a few weeks' time.

SPANNING THE PACIFIC

Preparing the Way for Pan American Airways' Service : Short Wave Direction Finding : Accommodation in the Martin "China Clipper"

An impressive flying picture of the first of the three Martin boats designed for long-distance transoceanic work—the *China Clipper*.

THE achievement of Pan American Airways in opening up a soon-to-be-regular service across the Pacific is of particular interest now that plans are being developed for a Transatlantic service. Although the conditions are not by any means similar, the Pacific and South American experience will be of tremendous value to Pan American Airways and there is every reason to believe that the company will make a serious bid to attain commercial supremacy across the Atlantic.

When Igor Sikorsky, writes an American correspondent, started his designs for the 19-ton S.42—which is now flown on the South American service, and is to be built in this country by British Marine Aircraft—manufacturers in the States queried the project of building such large craft and even said that the task was impossible. Subsequent events have shown that big boats can be operated securely and at a profit. These machines, of course, laid the foundation for the present service across the Pacific Ocean in the hands of Edwin Musick.

Glenn Martin, in common with Sikorsky, foresaw no obstacle in the building of even larger boats. He undertook to produce three 25½-ton flying boats for P.A.A. at a contract price of $1,200,000.

Economical Spaciousness

Passing through the Martin boat the observer is immediately impressed with the manner in which every inch of space has been utilised in the *China Clipper*, yet, at the same time, how the interior has an atmosphere of spaciousness. The passenger compartments are divided into four sections, the second section being twice as large as its three companions and presenting the appearance of a large lounge. Immediately behind the passenger compartments are toilet and spare storage compartments, which can also be converted into berths for night flying. These berths operate on the Pullman principle. Dressing and undressing can be carried out with privacy by men and women passengers in the lounge compartment, in which a special dividing curtain is temporarily erected night and morning. Ingenious fold-back basins, with hot and cold running water, make the large lounge an adequate dressing room

A radical departure from accepted American radio practice concerns the use of ground D/F stations, but these, it will probably be remembered, are worked on short wave. At the time when Colonel and Mrs. Lindbergh made their Atlantic survey and radio experiments some two years ago, radio engineers were endeavouring to extend the range of the direction finders on the 600-mile trans-Caribbean route—at that time the longest over-water service in operation. The new ground direction finder is primarily of the Adcock type, though to this basic system have been added recently developed auxiliary instruments and an installation procedure which, it is claimed, have successfully overcome the difficulties previously encountered in attempts to extend the range of marine and aircraft direction finders. Variable polarisation effects experienced at sunset, sunrise, and during the hours of darkness cause the normal loop direction finder to be subject to serious errors and have limited their consistent range to about 30 miles.

The new system has done a lot of successful work, in transoceanic use, on frequencies as high as 6,000 kc., or 50 metres. During the experimental flights on the *Pacific Clipper* ordinary communication was maintained with this new equipment up to 3,000 miles. As a direction finder the equipment has a range of 1,800 miles. Two stations, therefore, by overlapping, can cover an operative range of 3,600 miles—equivalent to the distance between New York and London. California, Hawaii, Wake, the Philippines and Guam are already equipped with the installation.

Money has not been spared by P.A.A. in their efforts to make the Orient route a success and the preliminary flights contributed materially to the practical knowledge of weather conditions, the determination of favourable flying levels and other essential data. One of the most interesting preliminaries was the departure of the 15,000-ton steamer *North Haven* for Wake and Midway Islands. She left San Francisco Harbour months before the experimental flights were made and her cargo was extraordinarily diverse. Apart from the sectionalised houses for the work party, even their plumbing and electric light equipment was included. Piling and floats for docks; diesel power plants for the radio stations; lighting and refrigeration equipment; and endless food supplies were carried. Each member of the construction force had been chosen for his proven ability not only in one but three and even four trades—and for his willingness to accept whatever duties his situation required. Two small towns have been erected by these men. The buildings on Wake and Midway compose not only offices, but also radio receiving stations and metereological bureaux.

Chelsea Wakefield Scholarships

THE examinations for the Wakefield scholarships in aeronautical and automobile engineering presented each year by Viscount Wakefield, president of the Colleges of Automobile and Aeronautical Engineering, will be held on June 11 and 12. The four successful candidates will be admitted to the College at the term commencing October 6 and 7, 1936.

Application forms for permission to take the examination must be received by the secretary not later than first post, May 8 next.

Candidates may obtain full particulars and application forms from the Secretary, the Colleges of Automobile and Aeronautical Engineering, Chelsea, S.W.3, upon application.

BRITAIN'S FIRST "POU" RALLY

Big Crowd Watches Aero-8 Club's Bank Holiday Meeting Near Southend : Mr. S. V. Appleby Flies a "Pou" from Heston

FELICITATIONS to the Aero-8 Flying Club, of Southend-on-Sea, for its enterprise in organising, at its Canute Air Park last Monday, Britain's first *Pou-du-Ciel* (or, bowdlerised, Flying Flea) rally. At the same time, one feels that they would have been wiser to have waited until such time as a rather larger swarm, flight, flock or incidence of airworthy Fleas could be mustered. As it was, an enormous Bank Holiday crowd, fed for a twelvemonth on newspaper stories of the "The poor man's airplane," invaded Canute Air Park (a commodious, if bumpy, field) with great expectations; when these were not realised, and when the crowd had in any case brought the proceedings to a standstill by swarming all over the field, it expressed its displeasure by a loud and impatient noise on the collective horn of its collective motor car.

One felt sorry for the officials, who spent the afternoon very good-temperedly shooing-off humanity which merely walked round in a circle and closed-in again behind the shoo-ers' backs. That no five-year-old tried to stop an airscrew must be put down to sheer luck. The crowd round the machines was so thick that one saw anxious owners of *Poux* apparently poking about round its trouser-legs in search of their pets. One also noticed a proud mother, armed with a No. O Brownie, securing a masterpiece for the family album—little Alfie nonchalantly reclining against a *Pou's* prop., with his numerous brothers and sisters leaning in equally negligent attitudes on the flying wires.

On top of all this, the Club was unlucky enough to suffer mishaps—of which more anon—to machines which should have taken part.

The Flea circus consisted of seven performers, only two of which carried their performance to the point of definitely flying; the others either buzzed angrily about the grass in an endeavour to fly, or (in the case of those too new and unprepared) just buzzed.

Needless to say, Mr. Stephen Appleby was the star turn. He was not flying his own well-known machine, but one built by the Putman Aircraft Co., of which he is technical director and flight tester. It was a very nicely finished *Pou* with a Carden Ford engine and a transparent centre section to give the pilot upward view. Mr. Appleby had actually flown it over from Heston *via* Hatfield the previous day, taking thirty minutes to Hatfield and forty-five minutes for the rest of the journey—about forty miles as the crow flies, but probably rather more as the Flea flew, for there were Sunday's historical hailstorms to be dodged and a really strong wind on the port beam. Mr. P. G. Marshall, flying a D.H. Hornet with its air brakes on, did the navigation for the trip, which, with the exception of the same pilot's recent trip to France, is undoubtedly the longest cross-country hop by any British-born Flea.

Mr. Appleby's show on Monday, too, was real flying, and everybody was obviously impressed as he purred round the field at a low altitude, coming down-wind at probably 85 or 90 m.p.h. and making steep, clean turns without any tendency to lose height. A race promised in the programme did not come off, but an anonymous enthusiast in an Aeronca went up and formated on the *Pou*—and later came down and formated on trees, hedges, motor cars, bowler hats, or anything else that suggested itself as a pylon.

But *revenons à nos Poux*. E. G. Perman and Co., Ltd., had a couple on view, both with Perman-tuned Ford engines, and Mr. F. W. Broughton flew one in good style. This concern, by the way, is shortly launching out with something new in the ultra-light line, as reported on page 409.

Then there were two of the official club *Poux*. One is a somewhat weather-beaten affair relegated to the status (so one read on the rudder) of "Taxy-ing machine," but the other has a fuselage far removed from the school of Maestro Mignet and of quite aeroplane-like shape. Usually, one understands, it performs well, but on this occasion Mr. Claude Oscroft, the Club's instructor, had considerable difficulty in divorcing it from earth, and even went to the extent of trying it downhill, which was also down-wind, and hoping the two would cancel out, with a bit left over in his favour.

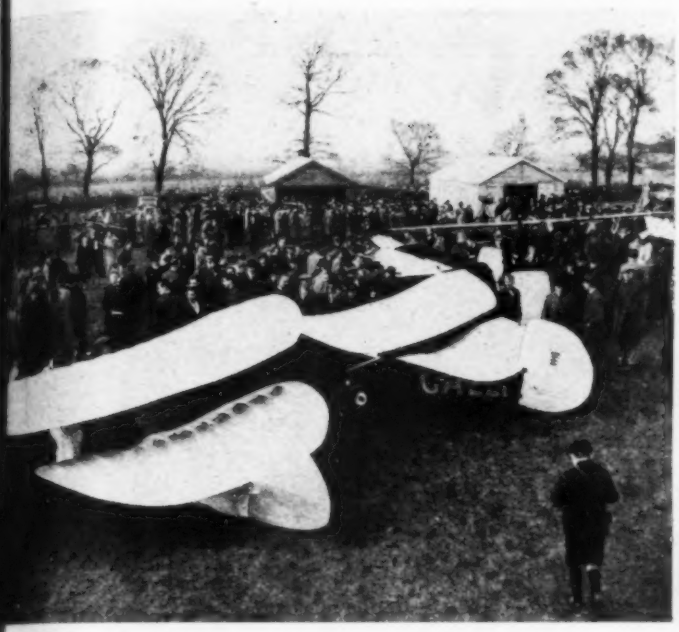
Two-stroke Power

Though not quite ready to take the air, Mr. C. E. Mercer's *Pou* was a beautifully finished job, with evidence of super-careful workmanship in every detail. The engine is a 750 c.c. Scott inverted two-stroke twin (28 b.h.p. at 6,000 r.p.m.), and the yowl (and smell) which it made must have conjured up visions of Southport sands and Manx land in the minds of the motor cyclists present.

Lastly, there was Mr. C. M. Cooper's G-AEEI, again very nicely finished, and with an Austin Seven engine geared down by means of a chain drive. The owner was looking for just another 100 r.p.m., and is confident of finding it by a gear-ratio alteration.

So much for the performers. Of the performance, as we have already indicated, little can be said for, one way and another, most of the things that were down in the programme to happen failed to do so. But three things *not* in the programme helped to fill the gaps as far as the spectators and the newsreels were concerned. Some little time before the official proceedings began, the Club's B.A.C. Drone was being taxied across the aerodrome when a petrol pipe broke. The carburetter, starved, spat indignantly, and the escaping fuel lit up. Someone had the presence of mind to swing the machine broadside-on the

One of the Aero-8 club machines has a fuselage of unorthodox but pleasing appearance. The engine is a Douglas flat twin. (*Flight* photograph.)



(Above, left to right) Mr. S. V. Appleby, flying the Putnam Flea, indulges in a little formation work with an Aeronca; some of the 5,000 spectators getting their money's worth, and Mr. Appleby flying over the newsreel cameras. (Below) The nose of Mr. C. M. Cooper's machine, which has an Austin Seven engine driving the airscrew through a chain reduction gear. (*Flight* photographs.)

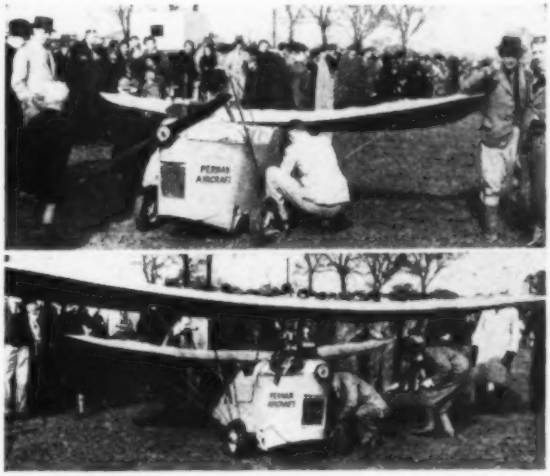
wind, so that the fire confined itself to stripping one wing of fabric before submitting to fire extinguishers, but it was bad luck for the Club, especially so early in the programme.

Secondly, Mr. P. R. Allison had brought an elderly Autogiro over from Sir Alan Cobham's establishment at Ford Aerodrome. The loud-speakers told an expectant crowd that the machine would give an exhibition. *And* it did. The pilot had got his rotor blades revving nicely in readiness to take-off. He opened wide the throttle. Instantly, for some reason unexplained, the machine stood straight on its nose. The still whirling rotor blades dug up mighty divots and flung them in all directions, while the pilot ducked down inside his cockpit until the bombardment was over.

Evidently inspired to emulation, the Club's taxy-ing *Flea*, later in the afternoon, stood on its nose in a hedge. Having gone one better than the Autogiro by attaining a considerable speed before doing so, it stove-in its proboscis fairly thoroughly.

Thus ended Britain's first *Pou* rally. If nothing else, it provided fun with an aeronautical flavour for hundreds of young people; and it will serve as a warning to *Pou* rally organisers to be prepared for invasions.

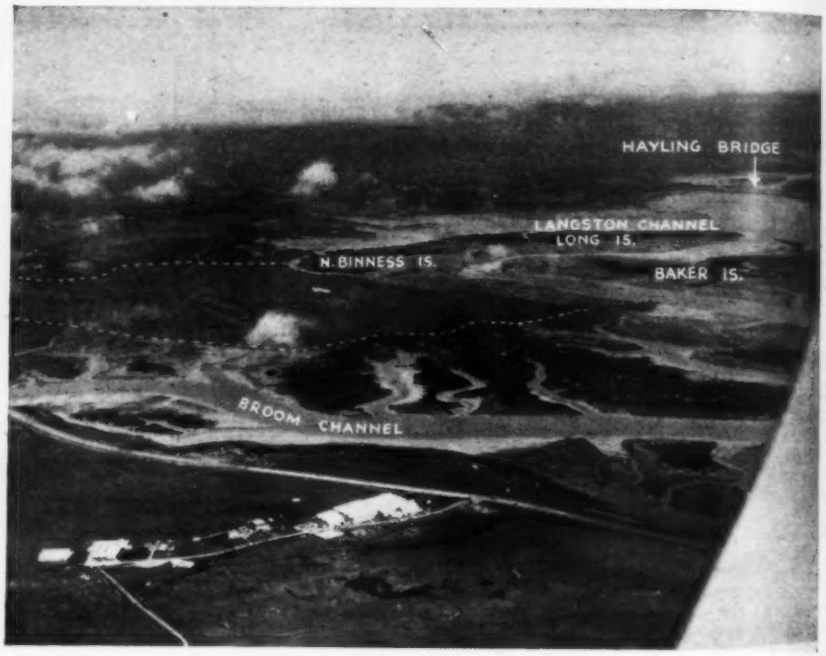
Unrehearsed item: The elderly C.19 Autogiro which visited the Rally lives up to its registration letters. (*Flight* photograph.)



Putting together the Perman *Pou*—two snapshots taken within a few minutes of each other. Assembly seemed to be a really quick and simple business. (*Flight* photograph).

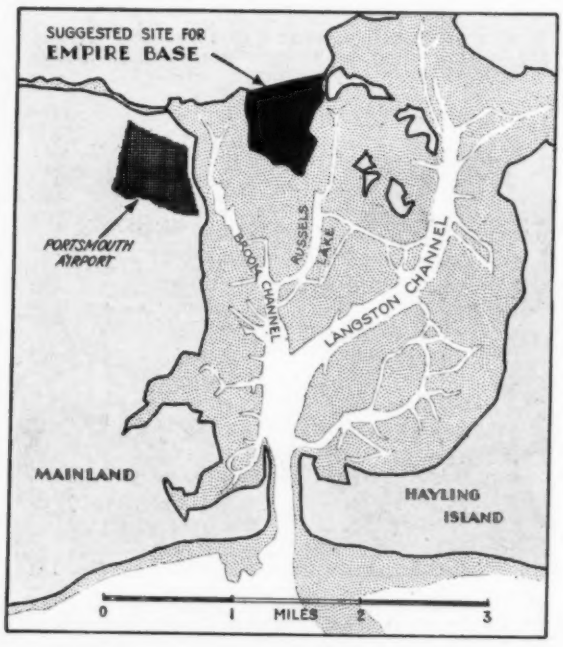
THE NEW EMPIRE AIRPORT

Where Will the English Base of the Empire Air Routes be Established? A Langston Harbour Project : The Claims of Southampton Water



Looking towards Farlington Marshes, the new site under discussion. In the left foreground can be seen the buildings and a corner of the Portsmouth Airport. (*Flight* photograph.)

WITH the first of the twenty-odd flying boats for the Empire air routes due to be launched by Short Brothers at the end of this month, the question of the English terminus of the great British Empire air routes assumes topical interest. So far no official announcement has been made, but it is known that the Airport Committee of Portsmouth Corporation has had under consideration for some time a project believed to involve the possible use of a small peninsula in Langston Harbour. Known as Farlington Marshes, the site in question lies just to the east of the existing Portsmouth Airport, separated from it by an arm of Langston Harbour. Farlington Marshes are surrounded by mud flats at low tide, but various channels run from the main Langston Channel up to within a short distance of the southern point of Farlington Marshes.



This sketch chart of Langston Harbour shows the existing Portsmouth Airport, the site at Farlington Marshes, and a portion of Langston Harbour with the channels which retain their water at low tide.

It might have been considered that the existing aerodrome would serve as the landplane terminus, and that by building a jetty which reached into Broom Channel a short distance from the beach, flying-boat operation would be quite feasible. Apparently, however, there is an alternative scheme, by which Farlington Marshes would be made suitable for an aerodrome and some part of Langston Harbour made available for the flying boats.

In many ways Langston Harbour seems to be desirable as the Empire flying-boat base. There is a railway running past the existing aerodrome, so that rail connection with London and other parts of the country could readily be provided. The expanse of water at high tide should be ample for take-off in any direction, and finally there is not much shipping to get in the way of the flying boats.

Damming or Dredging?

It is scarcely likely that an Empire air service will be made dependent upon the state of the tide for its "sailings," and it would therefore seem likely that dams would have to be thrown across the entrance to Langston Harbour, or, alternatively, from the point of Farlington Marshes to the coast near the southern end of the existing aerodrome. Both schemes seem likely to be expensive, and a way out of the difficulty might be to dredge some channels in the most useful directions from the existing natural ones. The prevailing winds are south-west, and a portion of the main Langston Channel runs in approximately the desired direction for considerable distances.

There is good reason for placing the Empire air route base somewhere in the Portsmouth or Southampton districts. Train services to London are good and could be further improved. There is already a large volume of

Langston Harbour, looking South towards the entrance between Eastney Point on the Portsmouth side and Gunner Point on Hayling Island. (*Flight* photograph.)

passenger traffic at Southampton, so that facilities for exchanging passengers and mails between liners and flying boats could easily be provided.

Southampton Water has plenty of water at all states of the tide, but it is not particularly sheltered, and at times there is a considerable sea running. Another objection to the use of Southampton Water itself might be the amount of shipping going up and down, which might conceivably interfere with the flying boats (and *vice versa*, of course). Nevertheless, Southampton Water cannot be ruled out altogether, and already it has close contact with aviation in the Fairey works on Hamble River and in the A.S.T. aerodrome (with its slipway) at Hamble, while the new works of British Marine Aircraft are being erected a short distance further up Southampton Water.

The existing aerodrome at Eastleigh would not be too well placed as a link in the Empire scheme because ground and/or sea transport would be necessary between it and any flying-boat base situated either on Southampton Water or in Langston Harbour. The ideal would obviously be a base which had its aerodrome adjoining the flying-boat jetties, and which was served by a railway line, so that passengers from and to London could reach it either by air or by water or by rail.

It remains to be seen whether such an ideal site can be found. One thing is certain: It is very necessary to take the long view, and to establish a base which can expand as traffic grows without becoming obsolete, either through limitations in size or through geographic unsuitability.

A £200 Single-seater

BUILT to sell at under £200, a new ultra-light single-seater monoplane will shortly appear on the market. Of the high-wing type and fitted with a Perman-Ford engine, it will be produced by E. G. Perman and Co., 24-26, Brownlow Mews, Guilford Street, Gray's Inn Road, London, W.C.1. The makers, who are well known as builders of *Poux-du-Ciel*, emphasise that it will be far removed from the *Pou* type of aircraft.

Next Monday's R.Ae.S. Lecture

NEXT Monday, April 20, Dr. H. J. Gough, M.B.E., F.R.S., and Mr. W. A. Wood, M.Sc., will lecture before the R.Ae.S. on "The Strength of Metals in the Light of Modern Physics." The lecturers will present an account of their recent work on the deformation and fracture of metals in which precise methods of X-ray diffraction have been employed in order to make a systematic study of the changes produced in the crystalline structure of metals. It has been found possible, for the first time, to show that failure under static and fatigue stressing is associated with changes in the crystalline structure which are identical. X-ray diffraction methods are shown to distinguish clearly between the effects of the application of safe and unsafe ranges of stress.

The lecture, which will be very fully illustrated, will be given at 6.30 p.m. in the Lecture Hall of the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2.

"Pou" News

A HELPFUL scheme for *Pou* constructors has been evolved by the Putnam Aircraft Co., of 407, Hornsey Road, Holloway, London, N., who built the *Pou* which Mr. S. V. Appleby flew so successfully at last Monday's Southend rally (reported on pages 406 and 407).

For a fee of £10 constructors may build their own machines in the Company's works, making use of its jigs and tools and having available the expert advice of Mr. G. A. Putnam. Whether they obtain their parts and materials from the Company or elsewhere is left entirely to their own discretion.

In addition to Mr. Putnam, the staff consists of Dr. H. A Tracey, Mr. S. W. Soden and Mr. J. Kirkpatrick, while Mr. Appleby is technical director and flight-tests machines.

* * *

The Austin Seven engine is being adapted for *Pou* work by Tupper Bros., Ltd., of Kingswood Works, High Road, Seven Kings, Essex. They are fitting a high-compression head, and a 2 : 1 helical reduction gear, accommodated in an Elektron nose-piece.

"FLIGHT" NEXT WEEK

NEXT week's issue of *Flight* will be a Special Number devoted to

LIGHT AIRCRAFT AND THEIR EQUIPMENT

One very fully illustrated section, which will include drawings of cabin and cockpit interiors, will review the types of smaller aircraft now on the British market, dealing with them primarily from the pilot's angle; another will present the views of private owners on their ideal machine. Among other special articles dealing with private flying will be one offering advice to newcomers to the movement who are seeking to join a club and to learn to fly.

Next Thursday FLIGHT April 23

AN INTERESTING CONTROL SYSTEM

DESIGNED for transmitting push-and-pull loads, Teleflex controls have some interesting features and many applications to aircraft work, in which they are now being widely used.

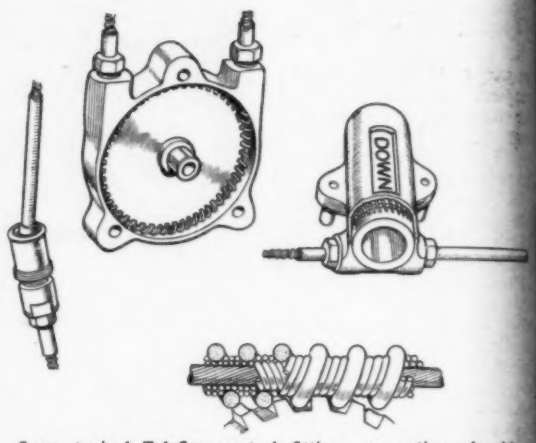
Briefly, the push-pull movement is transmitted *via* a flexible cable composed of a number of closely wound steel wire strands. The outermost layer consists of a wire very accurately wound (actually, to + or − half a thousandth of an inch) with a space between each turn; in other words, a fairly close spiral. Gripping the core layers very tightly, this outer winding thus forms, in effect, a rack with which an operating pinion can be engaged in order to propel the whole cable either backwards or forwards along a conduit. This conduit may be either rigid or flexible as required.

It will thus be seen that the Teleflex control lends itself to use with a very wide variety of controls, which may be placed at the terminal ends of a cable or at any intermediate point, the same remark applying to any gear which they are required to actuate. All that is necessary to insert intermediate gear is the removal of a short section of the conduit in order to allow the engagement of the pinion with the inner cable; control boxes and other fittings are made principally in alloy, and are thus light in weight.

Typical uses to which Teleflex controls are being put in aircraft include operation of carburetter controls, trimming controls, camera operation, torpedo setting, gun-ring control and wheel-brake operation.

One of the accompanying sketches illustrates one of the many fittings which the makers have evolved for use in conjunction with the cable; it is an undercarriage retraction indicator, and it will be seen that the basic principle of the pinion engaging in the cable is again followed.

The makers, who are Mechanical Remote Control, Ltd., 9, Cavendish Square, London, W.1, issue an admirable catalogue listing in detail the wide range of operating gear available for use in conjunction with the cable.



Some typical Teleflex control fittings—a section of cable passing round an operating pinion; an undercarriage retraction indicator; a close-up of the cable (seen in section); and (on left) a joint to give articulation in a rigid cable conduit.

British Oxygen Company's Move

AS from last Tuesday, April 14, the British Oxygen Co., Ltd., is installed in its extensive new offices at Thames House, Millbank, London, S.W.1. The telephone number (Victoria 9225) and telegraphic address (Aceterator, Sowest, London), remain unchanged.

De Havilland Issue

DIRECTORS of De Havilland Aircraft Co. have decided to issue forthwith the remaining unissued 100,000 ordinary £1 shares at 50s. per share to shareholders, in proportion of one new share for every five shares held. These new shares will rank for dividend as from June 1, 1936, but will otherwise rank *pari passu* with existing shares.

Increase of P. and P. Capital

FOLLOWING the first annual general meeting, to be held at Reading aerodrome on Friday, May 1, Phillips and Powis Aircraft, Ltd., announce an extraordinary general meeting, convened for the same day, at which shareholders will be asked to sanction an increase in capital of £125,000 in 500,000 3½ per cent. cumulative convertible preference shares of 5s. each, which will be subscribed for at par with an option to convert into ordinary shares within three years at a premium of 3s. per share.

The report of the company's directors states that "they have been able to obtain an offer to provide the necessary capital, and at the same time to secure the benefit of an association which should be of the greatest value to the Company."

Rumour has recently associated the name of Rolls-Royce, Ltd., with Phillips and Powis, and this may be the source of that rumour. The directors' report also states that it has been decided to include in the firm's policy a programme of construction of aircraft for Government purposes. Several small contracts have already been received, and the directors regard the prospects of further contracts as being favourable.

The accounts, which cover a period of fourteen months to December 31, 1935, show a loss of £20,236 7s. 2d., largely due, it is thought, to the expansion and development work undertaken.

Fairey Capital Increase

AT an extraordinary general meeting of the Fairey Aviation Co., Ltd., held in London on Monday, Mr. C. R. Fairey, chairman and managing director, said that the company would need more permanent capital if the situation resulting from the expansion programme was unduly prolonged.

The money was required for financing expenditure on plant and machinery, work in progress, etc., in connection with the starting up of the Stockport factory and also for additional working capital necessitated by the very greatly increased orders in hand.

The Stockport factory was already in operation and would soon be producing output, although it would not reach its full capacity for another year. The Hayes factory was already working to capacity. They were enlarging their Hamble factory and putting yet another new type into production. The Gosselies factory was busy with orders for the Belgian Government.

As regards their new types of aircraft, three at least should endure in production for some time, so that the company should be in a healthy position, due to the fact that it would be producing modern types with expectations of a considerable life before them. The Battle was an exceptional aeroplane, and one that gave every promise of being a very successful type.

The principal resolution, which was duly passed, increased the capital by the creation of 1,500,000 ordinary shares of 10s. each. It was proposed that 1,000,000 of these shares should be offered at the rate of 12s. 6d. in the proportion of one new share for every share at present held.

The remaining 500,000 new shares would not be issued for the time being, but the resolution gave power to the board to satisfy any remuneration calculated by reference to a percentage of profits to members of the board by the issue of shares at the same price as those to be offered.

NEW COMPANIES

In the notes below, for reasons of space, the "objects" of new companies are usually somewhat abbreviated.

CARDEN-BAYNES AIRCRAFT LTD.—Private company, registered April 2. Capital, £5,000 in 1,000 preference shares of £1 and 16,000 ordinary shares of 2s. each. Objects: To acquire the business of an aircraft engineer, designer and consultant heretofore carried on by Leslie E. Baynes, at Heston Airport, Middlesex. The directors are Leslie E. Baynes, 144, Cromwell Road, London, S.W., and Herbert Pemberton, 3, Collingham Road, London, S.W.5.

KIRBEL AERO (SALES) LTD. Private company, registered April 8. Capital, £100 in £1 shares. Objects: To manufacture and distribute aeroplanes, etc. The directors are to be appointed by the subscribers. Solicitors: Denton, Hall & Burgin, 3, Gray's Inn Place, London, W.C.1. Registered office: London Air Park, Feltham.

Boy's Life